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TEACHERS COLLEGE RECORD

VOL. II MARCH, 1901 NO. 2

EDITORIAL NOTE

The publication of a comprehensive outline of a course of study, such as is given in the current number of the RECORD, has a distinct value in presenting to teachers a general survey of the field. It shows more clearly than can be shown in any other way the relations existing between the various stages of a school course; it gives a setting for the work of each teacher and each grade. As a teachers' guide, therefore, if for no other reason, it is worth while to do such a piece of work.

There is, on the other hand, a certain disadvantage in publishing so complete a syllabus of a course which, in the nature of things, must be constantly shifting. In the first place it tends to fix permanently what is temporarily expedient. And, second, it suggests the general adoption of a plan which is obviously adapted to the specific needs of the Horace Mann Schools. I assume, however, that the readers of the RECORD are intelligent enough to use these articles in the right way. In so far as they disclose obvious defects in the work of the Horace Mann Schools they contribute directly to the solution of one of the chief problems set before this journal; and if they possess any merit either of originality or scientific application they will serve still higher ends.

It will be apparent to the experienced teacher that these outlines indicate an amount of work impossible of execution in the

time allotted in the Horace Mann Schools if every part were to be elaborated in detail. Teachers are free to select such portions for special emphasis as best suit the needs of their respective classes, but care is taken that what is done shall be typical and capable of application in other items of the course. Within the limits defined by the Superintendent in the curriculum and by the Supervisors in the courses of study (as published in the RECORD), each teacher guides his class as he thinks best. The function of the Supervisor is to assist the teacher in the selection, arrangement and presentation of materials of instruction, but what shall be actually presented and the manner of its presentation is left to the teacher under the direction of the Principals and Superintendent. Hence these courses of study, although prepared by the Supervisors, are largely influenced by the practical experience of the teachers in the Schools. In a very real sense, therefore, they are Horace Mann School courses.

I have been asked the question whether these courses are actually in operation in the Horace Mann Schools or whether they are ideals which we are trying to realize. This note is an answer to that question. They come as near to the actual practice of to-day as we know how to express it; to-morrow our condition may be different and we shall not hesitate to modify our practice accordingly.

JAMES E. RUSSELL.

THE COURSE IN GEOGRAPHY IN THE HORACE MANN SCHOOLS

By RICHARD ELWOOD DODGE, Professor of Geography in Teachers College, Columbia University, and Supervisor of Geography in the Horace Mann Schools; and CLARA B. KIRCHWEY, Instructor in Geography in the Horace Mann High School.

The course in geography in the Horace Mann School is naturally divided into two parts, that in the Elementary School and that in the High School. Geography holds an important place in the Elementary School from the third to the eighth year inclusive, and physical geography is an elective study in the fourth year of the Secondary School. These two aspects of the field will be considered in turn.

Elementary Course

The supervisor or superintendent who has to outline a course in geography for the elementary school is confronted with a task neither easy nor small. The breadth of the subject is so great and the precedents already established in reference to geography are so strong that it is very hard to enter the field unbiased as to method of treatment, and free to organize a course that shall be strong, progressive, sensible and practical. Such an outline can only be made by carefully deciding upon certain fundamental principles and then following those principles. These fundamental problems include — the point of view that a true conception of geography demands, the determination of what the children ought to secure of value from the study of geography, the relation of the subject to other subjects in the curriculum, and finally the method of treatment that will ensure the best training of children in geography, both from the standpoint of their present needs and their future probable needs.

Guiding Thoughts — The Point of View in Geography

Geography, whether viewed as an elementary or a university subject, is best defined by Dr. H. R. Mill[1] as "the study of the earth in its relation to man." It is well to remember, however,

[1] H. R. Mill, *The Realm of Nature*, Scribner's, 1897, p. 331; and *The International Geography*, Appleton, 1900, p. 2.

that man cannot exist without other forms of life, so that the life side of geography is greater than the mere human side. The earth is the stage, and life is the play that is being enacted thereon. It is not necessary, however, for the elementary pupil in geography to make an exhaustive study of the stage and its workings without reference to the play; neither should it be his task to study the play in all its details without reference to the stage. Such special studies may be considered to a certain degree legitimate in elementary schools, but cannot logically be included in geography. A child studying the origin of land forms, or the movements of the winds, is not studying geography, but physical geography, which is one of the fundamental departments of geography as a whole. Again, the child studying the social interrelations of neighbors, or of distant strangers, or the principles of government, is not studying geography, but the elements of sociology or history. Geography work in schools must include certain features from both these lines of thought; but unless the work be related in such a way that the study of life consequences leads to a study of earth causes, or *vice versâ*, the work has but little geographical significance.

The teacher, however, who makes his course by appropriating equal amounts from both sides, thinking that such a mingling may form a good compromise course, pleasing to all and combatted by none, makes a serious mistake, as his course may have no individuality or strength unless the blending of the threads be such that the causal relation of one series of facts with the other be a very prominent part of the work. The so-called "causal notion"[1] gives the teacher the cue as to the arrangement of the work, for geography, according to our definition, emphasizes the *relation* of earth and life. The causal idea must be prominent, and increasingly prominent throughout the work; but it is not the sole determinant of the order of topics or emphasis to be given to any topic. We must remember that we are primarily teaching *children* geography, and that we are *not* training scientific geographers, though we must train children scientifically. The order of facts and principles that would be presented to the more mature student must, in many cases, be rearranged to fit the needs, the abilities and the interests of young

[1] "The Causal Notion in Geography," F. M. McMurry, *Journal of School Geography*, Vol. I, No. 2, February, 1897, p. 48.

children. This does not mean, however, that there is to be no causal relation between the facts presented, but rather that the selected facts are to be arranged so as to bring out the causal relation in such a way that both the idea and the getting of the idea shall be of value to the pupil.

It is sometimes stated that the children must lead and guide us in our work; but perhaps it would be nearer to the truth to say that we teachers should lead and guide our pupils along lines of progress that experience has shown are of most immediate profit to the individual students, and most capable of laying the necessary foundation that future work in the subject demands. We must allow the children's interests and experiences to suggest to us the point of departure to be followed in introducing them to new fields; but we must not permit the momentary enthusiasm of the class to lead us away from the general line of progress necessary to good work in the subject. Such an aside may be of great momentary interest, but it is not usually to be pardoned if the pupils' future mental ability is jeopardized by such a digression. Our plan must be so arranged in large and small points that we lead the pupils by the lines of *least resistance*, but *not* least effort, from the unrelated and little known, but familiar facts, to the causally related known or unknown. This is sometimes summarized to the effect that " we must not follow the logical, but the pedagogical order," as if the pedagogical order were not logical, but illogical. Such is, however, a misstatement, and gives an unnecessary, wrong conception of the attitude of the best specialists in elementary education toward strong and scientifically ordered subject-matter. A pedagogical order that is not at the same time logical does not add strength but weakness to the cause it represents, and will not long stand the test of educational scrutiny and criticism.

Aims in Geography Work

We may say that our general aim in geography teaching is to give our pupils an understanding of the more important geographical conditions of the world, causally considered. This general statement, however, deserves analysis, for a study of geography should give the pupil something that will be of value to him long after a large proportion of the facts gained in the

study has passed from his mind. The leading aims of the course of study as a whole, and of the several parts should be the imparting of a knowledge of geography, and the power to make use of that knowledge in daily life. These two words, *knowledge* and *power,* are key words that suggest many details. A knowledge of geography does not mean merely information in reference to geographical conditions, but rather an understanding of geographical principles and the larger and more important facts that illustrate the principles.

1. KNOWLEDGE. — Such an understanding of geographical conditions is not given until the information that is acquired is so arranged and absorbed by the pupil that it becomes a part of himself, to be used in every-day life as a valuable knowledge that makes his life more full and useful. This aim must be realized in part each year, and not merely looked forward to as a climax of five or six years' work in school geography. The training must be such at all times that the facts and principles are immediately usable, which suggests that a course must be so arranged that a child leaving school at the end of the fifth or sixth year has gained something helpful in life.

2. POWER. — Next in importance to knowledge as an aim, as has already been suggested, is power. By power is meant the ability to think clearly and accurately; to reason from known to unknown; to test the geographical facts presented in text-books and newspapers, and to choose from the mass of perhaps illogical and perverted yarns the grain of truth that is worth being acquired as a new mental possession. Power also includes the ability to seek new material in all the better sources of reference, and to organize and apply the truth in an impartial and accurate way.

The knowledge of what are the best and most reliable books and atlases, the power to use these, and the ability to read and interpret maps of all the more common kinds, is a very important part of a pupil's gain from his school work. Training in seeking new material makes the pupil independent, gives him an impetus to seek the truth, and may impress upon him the fact that ought to be impressed, that his text-book is not infallible or all-comprehensive.

From such work ought also to come the feeling that not all is yet known in geography, and I can think of but few more

serious mistakes than to leave pupils with the feeling that they have gained from a text-book all there is to be gained in reference to any particular subject. The demand for more is a healthy want to be left in a pupil's mind, and this can be left if the pupil has had training in coming in touch with many sources of information, some one of which may have given him an inspiration and a new insight into the subject that makes him an enthusiast. The pupil who has had such training is less apt to jump at conclusions, more liable to be open-minded, and willing to look for and acknowledge the good points of an opponent. Such a power over one's self comes with good scientific training, to be gained not only from geography work, but also from history and nature study, if properly taught. A part of the task of the geography teacher, however, is to accept a large share in such training.

There are certain other so-called aims in geography teaching that are really overlapping phases of the two main aims thus far presented. They deserve especial mention here, however, because they emphasize the human element in geography work that is liable to be overlooked or too seriously minimized by those who believe in emphasizing the causal notion in geography. One of these points is suggested by the thought of " interdependence " — i.e., the general relation of individuals and nations — and the other by " training for citizenship."

3. INTERDEPENDENCE. — Inasmuch as geography has to do with the relation of man to the earth, and thus with a comparative study of the conditions of peoples over the world as a result of their environment and opportunities, geography can offer, perhaps better than any other subject in the common school, an opportunity for study and emphasis of the necessary interrelations of peoples and individuals, the dependence of one person on another, and the interdependence of all. Through such a study of interdependence comes a rational and sympathetic understanding of the ways of distant peoples, who ordinarily are merely objects of curiosity to pupils. The study may then become one where interest and not curiosity is appealed to, thereby making it possible to emphasize the causal side of life conditions.

So far as social dependence is a result of varying conditions of physical environment that necessitate varying methods of life, different occupations and industries, and perhaps different mental traits and national characteristics, the understanding of such

social dependence may very rightfully be a subsidiary aim in school geography, particularly in the early years. When, however, we go farther and study social dependence without reference to the controls that allow or necessitate such dependence, or when we try to have our lessons closing with moral tales, we are perverting the cause; and, indeed, the reiteration of moral tales as corollaries of any class work may, except in the hands of a master, develop in the minds of the pupils an abhorrence of the subject that stands to them solely, perhaps, as the peroration to a sermon on a familiar and much used text. A true conception of the vast and complicated series of national or community interrelations from the economic or any other standpoint must be the growth and development of years, coincident with the development of a broadening and fuller mind, richly equipped with the knowledge that may be made the foundation of such an understanding. Such a knowledge of society cannot be, with profit, more than suggested in the early years.

4. CITIZENSHIP. — Recent discussions in general pedagogy as well as concerning geography teaching emphasize the necessity, as has been suggested, of our schools training their pupils for citizenship. If this means, as some would have us believe, that geography includes a detailed study of the social conditions surrounding the individual (the play), a study of society as an institution, of government and the duties of a citizen toward the government, or even a detailed study of industries (especially of regions more or less remote), without any thought or emphasis of the stage which has formed the background, then the scope of geography has been very arbitrarily increased beyond the limits of its true field, and without necessarily bringing about the end in view. "A man may possess a vast knowledge with regard to the workings of our social and political machinery, and yet be absolutely untrained in those things that make a good citizen. . . . As ordinarily taught, they (Sociology, and Politics, and Civics, and Finance) tend to fix the attention of the pupil on the mechanism of free government rather than on its underlying principles; to exaggerate the tendency, which is too strong at best, toward laying stress on institutions rather than on character as a means of social salvation."[1]

[1] "Political Education," President Arthur T. Hadley, *Atlantic Monthly*, August, 1900, p. 145.

If, however, training for citizenship means, not merely the understanding of the elements of society, but the ability to be good citizens, then geography work can well add much to the cause; not, however, wholly through its subject-matter, but in part through the training in scientific thinking involved. If geography can give the young citizen the knowledge that makes his combat with his social and physical environment more intelligent and more successful through giving him a better understanding of the geographical controls of life over the world, and the conditions possible within the limits set by the controls, if it can give him the foundation of a future broader and richer culture, if it can give him training in clear and careful thinking, in weighing pros and cons, and in acting sanely and vigorously according to his well-founded convictions, then it can give training for citizenship of the best kind.

The Larger Plan of the Course

Guided more or less by similar ideas in reference to the proper scope of school geography, leaders in the subject have, within the last few years, come to divide the course into several distinct and yet related parts. The divisions in vogue in the different parts of the country are, however, very much at variance, so that there is by no means unanimity of opinion, particularly in reference to intermediate and upper-grade work.

Good pedagogy and common sense both decide that a child should enter into the study of geography through the door of his own home and life, and that home geography should thus be the first division of the subject. For the same reasons the child should work outwards from the home geography and gradually be led into a study of larger and larger world units.

In this second step, however, there is a great difference of opinion, some believing that the home geography should spread outward from the schoolroom in concentric waves, like the waves formed by a stone thrown into the water, expanding from the schoolroom into the schoolyard, the street, the ward, the city or town, the county, the state, the nation, the continent, the several continents, and the world. Others believe that the line of advance should be, like the rays of a spider's web, ever radially from the familiar home locality to the unfamiliar distance, along

the paths of least resistance and deepest interest, until the whole world, and the world as a whole, are related to the home region and to each individual pupil. The choice between these plans depends largely upon the contents and methods of home geography. In either case, however, the climax of this preliminary work is a view of the world as a whole, and either plan offers a host of serious and perplexing problems. In the Horace Mann School the preference is for the second plan, as later announcements of the course in detail will illustrate more fully. Thus the course under consideration involves the study of home geography as the first stage of advance, which merges gradually into a study of the world as a whole, as related to the home and to the individual pupil. (Stage II.)[1]

The third stage in the course is very generally conceded to be the study of the continents; but the order in which the continents are to be studied, the manner of treating them, the number of times they are to be considered, and other special problems are by no means settled. The custom has been until recently to "do the continents twice," as the expression is, once from the standpoint of the smaller or primary book, and once from that of the larger or advanced book. Furthermore the treatment the second time has frequently been the first treatment repeated, without much modification and with some additions. Partly as a result of this, and partly for other reasons, geography work has frequently been looked upon by teachers and taught as a compulsory nuisance upon which much time, energy and ill feeling were wasted.

The opposite plan of treating the continents but once in any detail, which has been ardently promoted by a few teachers within the last few years, has many points in its favor, and many against it. While repetition in concentric circles is to a large extent avoided, it seems impossible, according to this plan, to treat the more important continents at the time when they can be studied

[1] The course is divided into stages rather than by years or grades, because it is believed that the geography course as a whole is one unit, in which there are rhythmic pulsations that bring now one, now another phase of the subject uppermost; and that though the continuity of the subject is interrupted annually by the long vacation, there is not necessarily any reason, from the standpoint of the pupil, why the character of the material given, or the method followed, should seriously be changed each summer.

most deeply and fully. It is irrational to postpone the study of North America and the United States to the later grades, for the children should know their own country early, that they may understand every-day affairs as chronicled by the press, if for no other reason. It is also somewhat illogical to study the United States with great thoroughness in the early grades, when from the nature of the subject and the children the causal side of the work cannot be emphasized to the best advantage. Furthermore, the writer has not been able to plan a course according to this method that will ensure a child leaving school at the end of the fifth or sixth year having a general knowledge of the world such as he ought to have.

Either method has disadvantages, but it is believed by the writer that the first offers the fewer and has many superior advantages, provided the work is so arranged that the second treatment of the continents (or the more important ones), though based on the earlier treatment, is from an entirely different point of view.

Another difficulty in this stage and the following is in reference to the teaching of physical geography: shall this division of the subject lead or follow, shall it be detailed or general; shall it receive more or less attention than political geography, are some of the few questions along this line that have been ardently discussed in the last decade.

In the mind of the writer, physical geography has a right to a large amount of consideration in elementary schools. It must not, however, be taught as an end in itself, but as a means to an end, and that end, in the upper grammar grades, should be the causal understanding of geographical conditions over the world. Physical geography also has a place in the work of beginners in geography; but its place is not all-important. It must be brought in slowly as an entering wedge that shall be driven deeper as needs may require during the succeeding years, but which shall not be driven "home," perhaps, until the later intermediate years.

The arrangement of the facts of physical geography in the elementary school must be decided by the scientist, the leader in child study, and the practical teacher working together. The scientist should determine the field to be covered, and, in a general way, the order of steps to be followed in the work, and should

see to it that the pupils receive training in accurate and scientific thinking; the child-study expert should be able to show how the selected facts may be used with the greatest effect and the least waste of energy on the part of teacher and pupil; and the practical teacher, who knows his children better than any one else, and who alone sees the practical possibilities, should select the details, arrange them so as to be of the greatest value and assistance in the development of the pupils, and yet so rationally that neither the pedagogical expert nor the geographer can offer valid criticism or rebuke.

The way will be made more easy if, so far as possible, in physical geography, as in other subjects, the children be led forward so gradually and systematically that need is developed for a fact or a principle before it is presented. Children should be led and not driven to the study of geographic controls. To follow such a progressive plan means in the early years a different method of study from that in the later years, when the children can work longer at a given task without variations, and when they can think more logically and consecutively. Whatever is done at any stage should be done in such a way that causes and consequences are necessarily related, though it is wise to remember that the consequences that deserve emphasis are not always the physical, but more often the human consequences following certain physical causes. In the earlier years pupils may study the consequences and gradually be led to see the fundamental causes of topography, climate, drainage, etc., that exercise control over life. Such a plan rightfully followed should give good, practical mental training, should keep uppermost the human phases of the subject, and throughout a need may be created in the children's minds for a more thorough study of the causes in later stages.

Such a study of the physical facts in a somewhat extensive manner naturally follows, and in turn the elements of physical geography should be followed by a more full and careful study of the consequences of the present and past time, that can only be really appreciated as they are seen in the light of their environment. We might express it in some such way as this: that in the early years the children should be led to see some causal arrangement in the apparent chaos of physical, industrial, and social conditions with which they are always surrounded, thereby

laying the foundations and the need for the study of pure science — the causes. After the causes have been elaborated as fully as time and the needs of the pupils allow, the pure science (physical controls) should be made the basis of work, so that the applied science (history, civics, and social conditions) may be taught understandingly.

It is not intended to imply here that present social conditions are entirely due to the physical environment, but that the physical environment should be given the emphasis due it in each case; that where physical controls are important, for instance, in determining a boundary, they be noted, and when politics have fixed a frontier, that the failure to follow the natural boundary be also noted and accounted for.

One advantage of such an inversion of the plan of procedure is the variation in method of study as the years go on. Geography in the upper grades thus taught is not merely a duplication of the work of the earlier years, with more details to create work for the pupils; it becomes more rich and more full of significance, and the method may be made so different that pupils hardly realize they are covering the same ground. Instead of the circle outside a circle, or concentric method, it may be said that a circle is drawn in the early years; that then the circle is turned inside out, like a glove, and that the later work is built around it.

Furthermore, such a plan allows the human conditions to be emphasized in the earlier years, when the children are as a rule interested in what people are doing. It should be noted, however, that they are also interested in *why* people do certain things, which is one of the reasons for leading from consequences out to causes. As soon as we can get a why, there is a logical reason for giving the causes, and our children are thinking ahead and creating a need for more and richer food. They cannot become parrots or mere absorbing sponges. Children do not ask why, however, until they have seen the fact to be explained, which suggests that the study of consequences should precede the study of causes in the early years.

For these reasons Stage III in the outline under consideration is devoted to a study of North America, Europe, etc., from the standpoint of centres of life, and the reasons that have determined certain industries and occupations to be prominent in some regions, and others in others. The human relations to the earth

are made the most prominent part of the work, and through the study certain elementary generalizations are worked out as to the reasons for the various centres and their character. Such a treatment gradually introduces the child to the importance of the physical features in determining the present geographic conditions, and the way is paved for taking up the physical features as things by themselves worthy of analysis and classification, that they may have them at ready call in the later continental work.

In the earlier work of Stage IV the physical controls of life, that have been worked out in geography and nature study in the earlier years, are reviewed and elaborated as they are needed in the study of Africa from the standpoint of physical features, the object being to bring the hitherto somewhat scattered facts into their logical relation, so that they can be seen in the proper perspective.

As the human consequences may lead to a study of the causes, so the physical causes naturally lead up to the consequences, considered not from the social and industrial side, as formerly, but as illustrations and elaborations of physical laws. Thus the treatment of the continents in the later part of Stage IV is topical, the topics being such as to make the human conditions distinctly related to the physical features. Such a topical method of treatment from the physical standpoint allows the very best kind of mental discipline, and secures an understanding of the geographical conditions through the training of the rational, rather than the mechanical memory.

The work of Stage IV is brought to a close and tested in Stage V through the study of Europe, from the standpoint of principles of control, and in a comparative way. Stage V is thus a summary and application of all the previous work, so as to make the relations between the several continents stand out in their proper perspective. Throughout Stages IV and V much training is given in seeking information in sources outside the text, in studying maps and atlases, in weighing facts, and in applying the materials previously gained. Thus power as well as information, and perhaps even more than information, is acquired.

In conclusion it may be said that the writer strongly believes in the following division of geographic work: that the study of

nature and of home lore in the first years of school life should be introductory to home geography (Stage I); which should lead up to and merge into a globe knowledge of the world as a whole (Stage II); which gives a proper basis for the intelligent study of the more important continents (Stage III); in which the simple geographic principles of control should be worked out; that these principles after review and enrichment should become guides for a later, more detailed study of the political, social and physical conditions of the world by continents (Stage IV); which should be summarized in a comparative review from standpoint of principles (Stage V).

This brief outline of the course as a whole may offer but little, if anything, that is new; but the newest is not always the best. The course has been planned so as not to be revolutionary, but to give the physical and social sides of the subject their due proportion of attention, and at the times in the pupil's training when the greatest good may be expected to come therefrom. The aim is to have the work of constant service to the pupils in their daily life, and to make it possible for those leaving the school at eleven or fourteen years of age to have gained from the geography work that which will aid them in their future life. At the same time the endeavor is to lay foundations for future culture that need to be laid early, though they may not bear fruit before the pupil becomes of university age.

Stages I and II

Third grade, four periods of thirty minutes each. Fourth grade, one-third year, three periods of thirty minutes each.

Home Geography and the World as a Whole

Home geography, though for a long time recognized as the logical first stage in a school course, still presents a host of unsolved problems. The scope of the subject is so large, and the possible variations of matter and method so numerous, that many teachers are at a loss what to present and what to leave until later years. In other words, the subject lacks organization. Furthermore, there is a great difference of usage as to the title home geography, so that some consider under home geography

what others would include under a study of the rest of the world. In the Horace Mann School no attempt is made to demark the fields of either division of the work. The centre of the work being the pupil, and the aim being to give the pupil an understanding of his own personal relations to the earth conditions of his immediate environment and the more distant parts of the world, there is no logical reason for dividing the course. If division is considered necessary, then it should come when the child passes from the consideration of conditions with which he or his parents come into contact daily.

HOME GEOGRAPHY. — Though it is possible to classify the topics of home geography under a few large heads, like soil, hills, mountains, valleys, drainage, air, etc., and to take up the details of each group in succession, showing the illustrations of each in the immediate environment, it does not seem wise to do so for several reasons. In the first place, a classification of a character, to be understood by the children of such a youthful age, will not stand the criticism of an expert geographer. Hence, though classification be necessary, it should not be introduced at the beginning, but rather developed as the work progresses. A larger reason for not so arranging the topics is that it tends to take away from the subject its distinct personal flavor. Home geography needs to be ***home*** geography in fact as well as in name. In order to secure the interest of the pupil, his life in school, at home, and during his play hours should be made the basis of the geography work. In a school course, therefore, those topics should be first introduced that influence most directly the largest number of pupils in their *out-of-school life,* for out of school is associated with play and has already given the pupil many experiences that can be advantageously used. The school-yard may be a splendid field for geography work, but it should not necessarily be the field of introduction to the subject.

Every course in home geography, therefore, must vary with the locality. On the prairies of Ohio, or the plains of Dakota, in the country districts, at least, soil is perhaps one of the most fundamental topics for consideration. This does not, however, hold true in the larger towns or in all regions. In the Horace Mann School, situated on a high hill, only approached by streets in two directions, the most pertinent topics are the slopes up which the children toil on their way to school.

The aim of the course is to make the work as personal as possible, so that every child can contribute his bit of experience to the general cause. With such a beginning it is easy to lead out to the conditions of the school vicinity, and to the conditions of the home. The life of the pupils' home, the separation of the business office from the residence, the necessity for communication, for streets, lights, sewers, gas, water, etc., are all geographical topics that can be developed gradually and successfully from such a beginning.

As the work of home geography is a natural outgrowth of the preceding nature work, so it should lead up to the next larger division of the subject. For this reason, as has already been suggested, when the more pertinent home features influencing the life of the children have been thought out and related, the expansion of the field of the subject should be outward radially until the whole world is sketched in its relation to the individual pupil. The children should lead, and those regions be studied first that they agree are the most important to them. Such a plan is not followed if the progression outward be not from the life of the children but merely from the *schoolroom* life, which is to many of them far from interesting. The ward, city, county, etc., are not important features to them at this age, and to cut off and hem in the work by such artificial lines gives wrong impressions and causes an over-emphasis of points that cannot be real to the children. The government of the city may in its simplicity, as exemplified by the police, be real, but the mayor and aldermen are not real.

The need for city government may readily be emphasized through the study of streets and lighting, for instance,[1] but the details of the mechanism of city government are complicated and remote to the child.

The World as a Whole. — It is believed that the essential ideas necessary in reference to the world as a whole are its general shape, the relative position of the more important countries and continents, the life occupations and exports of the peoples, and our relation to and dependence on the whole world. The individual pupil is made the centre of the work so far as possible, and thus interest is maintained through the emphasis of personal relation.

[1] "Home Geography," by W. M. Davis, *Journal of School Geography*, Vol. I, No. 1, p. 5.

The means of communicating with and travelling to distant regions are considered in some detail, particularly the uses and geographical importance of roads, railroads, navigable rivers, oceans, lighthouses, life-saving stations, the telephone, the telegraph, post-offices, etc. Through such a study, with occasional reference to the controls that have determined the paths of the railroads, the position of lighthouses, etc., elementary ideas of the need of a central form of government can be developed. Here, as in home geography, it is the need of a government and not the form of a government that deserves emphasis.

The emphasis of the social environment at this time seems most desirable. The child is brought close to the human side at a period of development when activity and life appeal especially to him. Child-study has shown us the open door accorded to this life element, in the play and thought of the child. Through this study we are gradually learning to bring the work which we offer at this stage more into accordance with this tendency of the child mind; primarily to emphasize the life side where activity needs no interpretation; secondarily to present that which is too often looked upon as inanimate as truly living and working.

Only a beginning has been made, however, in the determination of the line of work to be pursued. The careful selection of material is of equal importance. This, then, is the next problem to be faced. In considering the social environment, what should be presented, and how should the approach be made? The needs of the child and their fulfillment suggest the answer to these questions, his interest naturally centering here. There need be no hesitation in taking advantage of this fact, for he is easily led from himself to a consideration of the agents involved in the supplying of his wants and the wants of others. This method of procedure results in revealing to the child "the world at work." He sees this, however, in and through his own domain. This does not imply that he is confined by the four walls of his home or by the boundaries of his city. It is not a far cry from one of his needs — the food upon the table — to the farmer whose labor has been a chief factor in providing it, nor to the means employed in its transfer from the farm to the home. Or again from the fuel upon which he depends to the miner who has made the satisfying of this need a possibility.

Through this study he not only realizes the labor involved

in meeting the needs of daily life, but also something of the physical conditions determining this labor. He sees his dependence upon others and the need of doing his share of the world's work. He is therefore gaining more than an introduction to the commercial and the physical aspects of geography. His interests are broadened and his sympathies deepened. He learns to think of the world as a great family and begins to feel his kinship in this family.

While this study of the home environment necessitates a departure from the immediate locality, all of the work is made to focus about the home, thus tending to strengthen the conception of New York as a great commercial centre. This is one of the aims of the plan — not only to open up the commercial side of geography through the home, but to give some idea of the greatness of this phase of life here in New York. Through personal observation in various lines some conception of the numbers of people congregated here should be formed. If this be appreciated, the necessity for sending products from far and near that the needs of this great city may be supplied will be self-evident. New York will be seen to reach out in all directions through its roads to gather in the products of the farm, the mill, the mine, etc. The importance of all the various means of transfer and communication will be apparent.

It has seemed necessary to preface this work on the more purely commercial and industrial side by a brief consideration of the local surface features. The conceptions here presented are so fundamental that they form a necessary basis for future work. It is essential that this foundation be laid at once rather than by degrees throughout the work, for by so doing many and long detours are avoided. Here, too, the human side has been kept in mind, though at times necessarily subordinated to the physical.

In passing from the home outward, those commodities in most common use are chosen as guides, and so far as time will permit, the most important exports of different selected regions are studied. As each commodity is considered, the life of the people of the country, the conditions of climate, etc., that make the commodity a possible product, and the methods of commerce are studied. In this way a causal study is made of elementary life and of the varying climatic conditions of the world. Differ-

ences of conditions become the key idea that helps us explain differences of products and life over the world, and the causal idea becomes readily prominent.

The Course in Outline[1]

Surface features in immediate vicinity of school.
- Highlands and lowlands.
  - School and homes in relations to surface.
    (Account for location of each.)
  - Slopes and highlands.
    - Slopes followed from school to home.
    - Steepness; relation of traffic to slopes.
    - Length.
    - Direction.
      (Slopes moulded and drawn.)
  - Extent of highlands.
  - Altitude of highlands.
  - Air of highlands.
  - Altitude of lowlands compared with highlands.
  - Extent of lowlands.
  - Air of lowlands.
  - Distribution of people and lines of communication in reference to lowlands and highlands in northern New York City.
  - Beauty of lowlands as contrasted with highlands.
- Drainage.
  - Stream caused by shower.
    - Its course — account for this by relating to highland and lowland.
    - Condition and work of water.
    - Its origin.
  - Brook.
    - Work of the brook.
    - Its course.
    - Obstruction causing falls, rapids, lakes, etc.
    - Its width, volume, etc.
    - Its origin.
    - Its use.
    - Its relation to a river.
- Hills.
  - Slopes.

[1] The details here presented in reference to Stages I, II and III are very largely the work of the junior author and were originally presented in thesis form, in partial fulfillment of the requirements for the Higher Diploma of Teachers College, in 1900.

Steepness.
Length.
Place of meeting.
Varying size and shape.
Altitude.
Vegetation.
Valleys.
Slopes.
Steepness.
Length.
Line of meeting.
Altitude compared with hill.
Varying size and shape of valleys.
(Moulding and drawing.)
Life in New York City.
Extent of city.
Numbers of people — shown by —
Closely built, many-storied dwellings.
Crowded conveyances.
Great gatherings, etc.
Streets.
Need of streets.
Great number.
Reason for routes followed.
Need of grading.
Need of pavements.
Need of sidewalks and crossings.
Need of light.
Need of sewers.
Need of conveyances.
Care of city.
Need of street cleaners.
Need of police.
Need of fire department.
Advantage of city departments over individual effort.
Railroads.
Need of street and steam railroads.
Reason for routes followed.
Need of grading.
Need of cars — varying in kind with season.
Water routes.
Hudson.
Use as a route of travel.
Vessels — passenger and freight.
The harbor:
Need of a harbor.
Its size, depth, shape, etc.

Vessels, steam and sail; tug-boats and ferry-boats; railway transfer cars, etc.
Need of piers, etc.
Business activity in vicinity of harbor.
Lighthouses — their use, location (islands, peninsulas, etc.

Needs of daily life — how supplied in a city.
Food.
Bread.
Transportation.
From bakery.
From wholesale house.
(Need of each shown.)
From mill.
(Work of the mill considered briefly and illustrated by country grist mill.)
(Work of the farm — cultivation of wheat — harvesting, etc.)
Milk.
Transportation.
From milk depot.
From dairy farm.
Butter.
Transportation.
From store.
From wholesale house.
From creamery.
From dairy farm.
Work of the various stages shown as before.
Vegetables.
Transportation.
From store.
From markets.
From gardens.
(Need of each stage shown.)

Location of gardens observed in the consideration of the work of the gardener. Position accounted for by noticing action of water on slopes, and conditions of soil and moisture favorable for growth. Temperature required also noted. This work is based on results gained from gardening work in Nature Study in Grades I and II.[1]

Same plan followed for meat, fish, fruit and other products secured from neighboring producing regions.

Clothing.
Cotton.

[1] "Nature Study in the Horace Mann School," Elizabeth Carss and Francis E. Lloyd, this Journal, Vol. I, No. 2, March, 1900, pp. 10-16.

Transportation.
From stores.
From wholesale houses.
From factories.

Topics treated as before — former methods of manufacture (home looms, etc.) compared in brief with method of to-day.

(Cotton plantations and transportation from cotton region omitted.) Same plan followed for woolen clothing, adding one stage more, that of the sheep farm.

Fuel.
Wood.
Transportation.
From wood-yards.
From forest.
(Topics treated as before.)
Coal.
Transportation.
From coal-yards.
From mines.
(Description of a coal-mine — work of the miner.)
Homes — materials needed.
Lumber.
Transportation.
From lumber-yard.
(Distributing centre.)
From saw-mill.
(Transformation of lumber.)
From forest.
(Lumbering. Appearance of forest, life and work of lumbermen.)
(Work of each stage shown.)

Same plan for other materials used in construction — as stone, brick, etc.

In the consideration of those stages not found within the limits of the city, as the farm, mine, etc., the industry as seen in regions around New York is treated.

The need of mails, telephones, telegraph, etc., in promoting transportation is shown. Comparisons made throughout with primitive life, especially as shown in literature, in reading of Defoe's *Robinson Crusoe*.[1]

More distant regions contributing needed products to the people of New York.

[1] See "Course in English in Horace Mann School," by Franklin T. Baker, this Journal, Vol. I, No. 3, May, 1900, p. 6.

Commodities chosen with reference to illustrating interesting phases of life, extremes of life conditions, various methods of transportation and interdependence. Purpose also to give a general idea of the various continents, as to highlands, lowlands, leading cities, and to develop the globe idea of the world, and relation of its parts in direction and distance. No attempt is made to treat the details of the continents as such.

Northern North America.
- Sealskin.
  - Its use.
  - Location of region from which this product is obtained.
    (Direction from home.)
  - Seal fisheries.
- Climate — compare with weather of selected winter day.
- Plant and animal life.
- People — Eskimos.
  - Homes.
  - Habits of life.
- Transportation.
  - Methods in country.
  - Routes to New York.
    (Time required.)
    - Mountains as barriers.
      (Dwell upon idea of mountains, impressing height, slopes, difficulties of ascent, etc., comparing with local heights known. Illustrations used in abundance.)

Southern North America. (Mexico.)
- Coffee.
  - Location of region from which this product is obtained.
    (Direction from home.)
  - Coffee cultivation.
- Climate.
- Plant and animal life.
- People.
  - Homes.
  - Habits of life.
- Transportation.
  - Methods in country.
  - Routes to New York.
    (Time required.)
  - Chief port.

No special study of the United States has been planned for at this time, a sufficient working knowledge of people, of climate, etc., being gained through the work of the first stage. Principal water routes, mountains and great ports are learned in connection with transportation from the northern and southern sections of North America.

Northern South America. (Valley of Amazon.)
India-rubber.
Use.
Location of region from which this product is obtained.
(Direction from home.)
Method of obtaining rubber.
Climate.
Plant and animal life.
People.
Homes.
Habits of life, etc.
Transportation.
Methods in country.
Routes to New York.
(Time required.)
Chief port.
Southern South America.
Hides and wool.
Location of region from which these products are obtained.
(Direction from home.)
Herding on the pampas.
Climate.
Plant and animal life.
Transportation.
Methods and routes as above.
Why eastward.
Difficulties in crossing mountains.
Means employed.
Northern Eurasia.
Sable — other furs.
Location of region.
Hunting of fur-bearing animals.
Climate.
Plant and animal life.
People — Lapps, Samoides.
Homes.
Habits of life.
Transportation.
Methods in country.
Routes to New York.
West Central Europe. (Switzerland.)
Cheese.
Location of region in which dairying is carried on.
Dairy farms.
Care of herds.
Climate.
Plant and animal life.
People.

Transportation.
Methods among mountains.
Routes to New York.
(Time required.)
Scenery.
Southern Europe. (France and Spain.)
Wine.
Location of grape-growing region.
Vineyards.
Climate.
Plant and animal life.
People.
Transportation.
Methods in countries studied.
Routes to New York.
Chief port.
Southeastern Asia.
Tea.
Region from which obtained.
Tea culture.
Climate.
Plant and animal life.
People (Chinese).
Homes.
Customs.
Habits of life.
Transportation.
Between India and China.
Why principally by water.
Means of transportation over mountains.
Routes to New York.
Chief ports.
Central Africa.
Ivory.
Its use.
Region from which obtained.
Method of securing it.
Climate.
Plant and animal life.
People.
Homes.
Habits of life.
Transportation.
To coast (caravans).
Routes to New York.
South Africa.
Diamonds.
Location of diamond fields.

Diamond mining.
Climate.
Plant and animal life.
People.
Transportation.
Method in country.
Routes to New York.

From the continual use of globes throughout the work, the shape of the earth, the position of the great land and water masses, the warm, temperate and cold regions should have been seen.

By a gathering and placing of facts learned through the study of individual countries, the heat belts of the globe will be readily located, as well as the plant and animal life common to these belts.

Globe.
Summarized as to form (simple proofs), size, position of land and water masses. (See course in English, *loc. cit.*, p. 7.)
Grouping of countries studied climatically.
Heat belts.
Reason for differences seen.
(Simplest conceptions only given.)
Grouping of plant and animal life.
Rotation.

Idea of map developed toward the close of this stage. Need of a scale shown and the ***use*** of the parallels of latitude and meridians of longitude.

Throughout this work show the effect of the telegraph, mails, cables, etc., upon commerce. Compare advantages of the present with past conditions.

Related Observational Work

It is expected that the pupils entering upon a study of geography in the third year of school will have studied the following points in the earlier years:

Direction and Distance. — Cardinal and semi-cardinal points of compass; relative position of familiar objects. Distance in feet, yards, etc. Size.

Non-Instrumental Weather Observation and Records, at certain seasons, including,
Character of day, i.e., clear, fair, cloudy, stormy.
Direction and strength of wind.
Temperature, i.e., warm, cool or cold.

Precipitation, as snow (coarse or fine), rain (heavy or gentle), fog, etc.

Beginning with Stage I and continuing through Stage III, a course in observational geography is conducted parallel with the systematic course outlined. The work planned is progressive, and related to other work in geography and nature study. Through both lines of work a basis is laid for the elaboration and enrichment of the principles of physical geography in Stage IV. The following is outlined for Stages I and II.

Non-instrumental observations to bring out relations among weather elements. Study to occupy several scattered periods, as October, December, March, May, during year, so as to illustrate seasonal variations of weather.

Winds.

Direction and velocity (classify as calm, light, moderate, strong, gale).

Relation to temperatures.

Relation to character of day, and precipitation.

Sunshine Chart.

Orange — fair.
Yellow — clear.
Light gray — cloudy.
Dark gray — rainy.
White — snow.

} At end of each period find number of sunshiny days, cloudy days, stormy days, etc.

OBSERVATIONAL WORK, PARALLEL TO LATER PORTION OF STAGE II

Sunshine and Temperature. — Dry bulb thermometer to be used.

Position of sun in the morning — window receiving sunlight.

Position of sun at noon. Passage from eastern to western part of sky.

Position of sun in afternoon — window receiving sunlight.

Direction of shadow in morning, at noon, in afternoon.

Difference in intensity of light in the early morning, at noon, in late afternoon. Reason.

Length of shadow cast by a vertical rod measured at different periods throughout the day. Time of longest and shortest shadow noted. Time determined from length of shadow. Daily temperature in relation to length of shadow at cer-

tain hour each week noted. Relation between length of shadow and temperature. Reason for change in shadow length.

Moon.

Position of new moon. Direction of horns; direction of horns of old moon.

Position of moon at time of first quarter, full moon, and last quarter.

Account for changes in appearance of moon.

Stage III

Fourth grade, two-thirds of year, three periods of thirty minutes each. Fifth grade, three periods of thirty-five minutes each.

The More Important Continents from Standpoint of Industrial Life

Among the difficult problems that confront a teacher entering with his class upon an elementary study of a continent, is that of avoiding pure memoriter work, and yet at the same time securing a good acquaintance with certain fundamental facts that must be at ready service if any causal study is to be undertaken. A certain knowledge of the general climatic position of a continent is absolutely essential at the beginning, and yet such a knowledge cannot be developed as fully as is desired by the beginning of the fourth year. Hence certain fundamental facts in reference to heat belts must be early taught without developing the ideas. No more should be taught than is necessary for immediate use, and the delay should not be long on such details. The plan of teaching such facts advocated here may not be pedagogically strong; but the effectiveness of the later work is so much increased by such a beginning that the break in method needs no apology.

In a similar way a teacher finds it necessary to drill his class in visualizing the location of many places in the United States, that cannot be located causally. To secure a working acquaintance with the necessary details of location in the United States by development would be so time-consuming as to be absurd; to neglect to secure such an acquaintance would bring down upon

us the well-earned condemnation of the parents who demand, and rightfully, that their children shall know their own country, at least sufficiently well to understand the whereabouts of the principal events chronicled in the daily press.

As has already been suggested, the point of view in the early treatment of North America is that of industrial centres. By a study of the leading industrial centres of the United States, and their relation through commerce, it is possible not only to make the life side of geography prominent, but also to develop a need in the pupil's mind for a better knowledge of the physical causes of such great consequences. The teaching of North America from the standpoint of industrial centres does not, however, mean an emphasis of technical details of industry, which are neither earth-determined nor earth-influenced except in a very remote way.

The geographical phases of industries that to the author seem legitimate parts of school work are mainly their distribution and general character, when these have been in part, at least, determined by the setting in which they flourish. For instance, it is the presence of coal and iron in the neighboring region that makes Pittsburg, Pa., an iron-smelting city; but it is the ingenuity of man, and not the presence of coal and iron that has determined the technical details of iron or steel making. Again, it is the presence of natural water power that makes possible such large manufacturing places as Holyoke, Mass., noted for its paper-mills, or Manchester, N. H., with its world-famous cotton mills; but the geographical conditions have determined only the possibility of manufacturing by water power, not the character of the industry. In the same way certain agricultural areas are determined in their place by the combined occurrence of suitable soil and climate, and the kind of agriculture may to a large degree be determined by nearness to a market. The technique of raising cotton, celery, or Indian corn is not, however, except in the most remote sense, geographically determined.

Not only are industries on the whole not earth-determined and hence not to be considered logically a part of geography for school purposes, but there are several other reasons why such details should not be included in school work. In the first place, the details of a complicated industry, such as the making of fine bolted flour, or the refining of gold, are not easily understood

even by the average adult, and a visit to a mill or a refinery leaves no clear images, but general conceptions only. Such conceptions are not as clear cut and accurate as the conceptions in school geography work ought to be, in spite of the fact that the adult has a better power of seeing the essentials, and a better mental basis for understanding the processes than any school pupil could have. Such conceptions are of little permanent value, of but small relative value, and surely the whole field of geography offers scores of large subjects more capable of giving knowledge of greater present and future value, and more mental power. Such details are for the technical schools or the business training of later years, and should not take up time that could and should be devoted to more pertinent and valuable work.

Again, a detailed knowledge of any industry, however interesting, is not necessary to a child in his every-day life. Exception may be suggested in the case of those industries that furnish occupation to a child's parents. Yet further thought will show that in most cases these are just the industries concerning which the child in most cases needs no training; long familiarity with them has given him a first-hand knowledge, that never could be gained from books and excursions, and a study of such industries would not only be a waste of time, but a bore to the pupils.

Therefore, inasmuch as technical details of industries are not necessary to the pupil, not easily illustrated to him, or understood by him, and of but little permanent or relative value, there seems no adequate reason for devoting to them the large amount of time sometimes given.

This does not mean, however, that the industrial side of life should be neglected or omitted. This would be a serious mistake, for the introduction to earth causes in the elementary grades must be through the study of life consequences, and particularly those consequences with which the child is most familiar. Industries furnish the very best possible introduction to the study of human geography, but too great elaboration of details detracts from the geographical value of the subjects, and places the emphasis of the work on the ungeographic details, which are not necessary from the standpoint of clearness. A child does not need to study plows and harrows in order to understand the necessity of making soil fine and loose for successful farming any more than he needs

to know the detailed working of a shoe sewing machine as a basis for understanding that manufacturing consists in turning raw products into finished goods.

What a pupil does need to know in reference to an industry is what is done, and the geographical conditions that make the industry possible. Whether the farmer shall raise wheat or potatoes or corn is not of such importance as are the conditions that make agriculture possible at all. Only when the conditions particularly favor some special form of agriculture should emphasis be laid on that form, and even then the only details that should be studied are those that determine the habits and customs of the peoples in a large way.

The geographical conditions, then, that are essential to the successful carrying on of an industry are the facts to be developed through industry, together with those social conditions that are the results of the attempt to carry on the special line of work. The great groups of industry that stand out most strongly as objects for study are agriculture, grazing — including dairying, lumbering, hunting and fishing, manufacturing, and commerce. Each of these groups may be illustrated by many varieties, depending, perhaps, on local or special conditions, but in each variety there are certain fundamental ideas common to the group as a whole. The geography teacher's task, therefore, is to develop an idea of the geographical conditions that determine the whole group, more than the special form which is used for illustration. At least such is the task in the elementary work where the causes are being developed. In the advanced work, where life consequences are, or should be, studied as results of physical causes, it is possible to go into details and to illustrate the intimate relations of detailed conditions to minor causes. For instance, in the elementary grades, the study of what makes manufacturing possible in New England, lays a basis for developing a more complete knowledge of the essentials of manufacturing. In the upper grades, the influence of climate in determining the manufacturing of certain special kinds of cloth in New England may be brought out. Such a matter, however, would be too special for the elementary work.

Geographical Elements in Industries. — Such being the field of work and the point of view that seem best adapted to lower or intermediate grade work, let us see what are the essential

geographical elements underlying each of the great groups of industries.

AGRICULTURE. — The four geographical essentials of agriculture are a slope suitable to hold the soil that is formed, good soil, a favorable climate, and accessibility to markets. Given these conditions in an occupied country and agriculture thrives. The essentials of agriculture are not to be found best shown in large farms where there are all the modern conveniences in the way of improved machinery, wind-mills, fertilizers, etc., but in the small farms of certain parts of New England, for instance, where the ground is tilled in a most simple way. Of course in this case and in the topics which follow, any generalization as to the essentials must be worked out from several instances, taken from different parts of the country; but the work fails unless the generalizations are made, and so clearly developed that they are a sound basis for later work.

GRAZING AND LUMBERING. — Practically the same conditions pertain here as in agriculture, but in different aspects. Grazing can be carried on on steeper slopes and poorer soil than agriculture, and accessibility to market is not an important factor, except in certain forms of dairying. Slopes so steep or inaccessible as not to be needed for grazing are apt to be devoted to forests; but the three industries are closely related, and their occurrence is largely due to geographical conditions. (See also Course in Nature Study, *loc. cit.*, p. 21.)

MANUFACTURING. — Manufacturing depends on the availability of raw material, perhaps occurring as products to be secured directly from the earth, the presence of power in some form, and again the accessibility to markets. The best place to see the geographical significance in the location of this form of industry is not in some large cotton mill, with its noise and movement, even though the power be water, but preferably in some country grist mill, where the water can be seen setting the grinding stones in motion, and where the whole process of changing unground corn to meal ready for use can be seen without any complications. In such a case the importance that natural power plays is readily emphasized.

MINING. — In the group of industries included under the head of mining, we have one of the best illustrations of geographical control, inasmuch as mining, including quarrying, is con-

cerned entirely with securing from the soil and rocks of the earth natural products of economic value. Therefore all forms of mining are determined in their position by geographical conditions, and the importance of those conditions can be easily made clear.

FISHING AND HUNTING. — Fishing and hunting centres are well determined in their location by their geographical position. It is a good harbor, favorably located for easy access to fishing grounds that determines the success of a fishing town, and hunting for a livelihood is largely confined to those parts of a country having climatic conditions not permitting successful permanent residence. (See also Course in Nature Study, *loc. cit.*, pp. 20 and 22-23.)

COMMERCE. — In order to be a good centre for trade a town must be so situated that it can secure a large amount of goods to be sold with the least cost of transportation from the place of production or manufacture. It must also have a ready means for sending the goods away to other cities or other countries, at small cost and little delay. Thus a commercial town is determined in its location by several factors that are geographical, the more important of which can be easily illustrated and emphasized in almost any direction.

SCENIC CENTRES. — There are a number of thickly occupied regions in the United States, to which people have been attracted by the scenic conditions that make such places attractive to travellers and pleasure seekers. The caring for such visitors as go to such a scenic centre as the Yellowstone National Park can hardly be called an industry, but it is an occupation determined in its location by the features of a geographic nature that make the Park famous. In most regions that may be grouped under this head the features that attract both visitors and permanent residents are geographic, so that the centres are geographically determined.

In any case the best illustration of an industry is not one where there is the greatest complication, but that in which the fundamental conditions stand out most clearly and with the least complexity. When the essential conditions of any centre have been brought to a focus through the inductive study of several uncomplicated instances the more complicated instances, in which the fundamentals are obscured, may be studied as varieties of a general case.

Thus it is possible to classify the instances, not according to size and supposed importance, but according to a classification based on causal conditions.

It is in this way that industries are studied in the Horace Mann School, somewhat fully, but not technically, and yet in such a way that the geographical side is emphasized. At the same time the life or human side is made the basis of the work in the lower grades, thereby emphasizing the aspect of the whole field of geography that is to most pupils of elementary school age of the greatest interest.

It is believed that the plan outlined enables the teacher to make the strongest use of "types," the typical case being in many instances, however, developed as a composite rather than exemplified by a complicated and striking example. Such a use of the idea of types corresponds with the meaning of types as used by working scientists.

The course outlined in the rough follows. Each area or centre is located as it is treated, routes of transportation are followed on a map and much training is given in visualizing locations, but as far as possible causally. At the end of the fourth year the pupils have gained a good working knowledge of the United States, and further they do not see the country in pieces, but as a whole, with intimately related parts.

North America

Agricultural Sections. — Cotton.
- Cotton belt (of United States).
  - Slope, soil, temperature, rainfall.
  - A cotton plantation.
    - Extent.
    - Life.
  - Varieties of cotton.
    - Inland.
    - Sea Island.
      - (Other cotton sections noted.)
  - Cotton centres.
    - New Orleans.
    - Galveston.
    - Savannah.
    - Charleston.
  - Reasons for these locations.
    - Location in regard to cotton region.
    - Ease of transportation.

Manufacturing Sections.
  Destination of raw product.
  Reason for this.
    Water power.
    Ease of transportation.
    Country unsuited to agriculture.
    Nearness to centres demanding finished products, etc.
  Transportation.
    From cotton section to manufacturing region.
    Greatest New England port.
    From port to manufacturing centres — Fall River, Lowell, etc.
      (Account for location.)
    Distribution of finished products.
      To various parts of the United States.
      To foreign countries.
Agricultural Sections. — Wheat, Sugar-cane, etc.
  Wheat producing areas. (Great Region of the United States.)
    Slope, soil, temperature, rainfall. (Compare with cotton section.)
    Wheat fields.
      Extent.
        (Other wheat sections noted and compared.)
    Great wheat shipping and milling centres. (Reasons for this.)
      St. Paul.
      Minneapolis.
      Milwaukee.
      Chicago.
      St. Louis.
      Winnipeg.
      Montreal.
      Quebec.
      (One centre studied in sufficient detail for clearness — others compared with it.)
    Transportation.
      Routes by which grain and flour are transported, water and rail.
      Ports from which shipped.
      Foreign countries dependent upon our wheat fields.
  Sugar-cane region (United States).
    Slope, soil, temperature, rainfall. (Compare with wheat and cotton sections.)
    A sugar plantation.
      Extent.
      Life.
        (Other sugar-cane sections in North America compared.)

Great sugar ports.
Havana.
New Orleans.
Destination of raw products.
Brooklyn.
Philadelphia.
Boston, etc.
Transportation.
From region raising product to centres refining it.
Distribution of finished product.
Corn, oats, fruits, tobacco, treated as preceding topics.
(Density of population as dependent upon productive regions shown.)
Grazing Sections.
Cattle.
(Great Plains. — Slope, soil, temperature, rainfall. Compare with sections studied.)
Ranch.
Extent.
Life of cowboys.
(Compare with herding on the pampas.)
(Other grazing sections of North America noted.)
Dressed-beef centres.
Chicago.
Kansas City.
Transportation.
Shipping of cattle from producing areas. Routes traversed.
Routes of distribution of beef products to various parts of the United States and abroad.
Routes by which hides are sent to New England, Pennsylvania, etc. — Ports receiving raw material. — Manufacturing centres. — Distribution of finished products.
Dairying.
(Prairies. — Slope, soil, climate.)
Compare with dairying seen in vicinity of home locality.
(Other regions in which dairying is carried on noted.)
Centres of dairying regions — Utica, Des Moines, etc.
Transportation of dairy products.
Sheep.
(Great Plains.)
Ranch.
Size.
Life.
(Other sheep raising sections noted.)
Sheep and wool markets.
Galveston.

San Francisco.
Cheyenne.
Fort Worth.
Cincinnati.
Transportation of wool.
Routes to New England, New York, etc.
Ports receiving raw material.
Manufacturing centres — Philadelphia, New York, Lawrence, etc.
Distribution of finished products.
Lumbering Sections. (Northern United States.)
Slope, soil, temperature, rainfall.
(Compare with other sections studied.)
Appearance of region.
Lumber camp. — Compare with lumbering seen in vicinity of New York. (See Nature Study Course, *loc. cit.*, p. 21.)
(Other forest regions of North America compared.)
Differences in lumber grown in various sections.
Uses.
Lumber centres.
Chicago.
Minneapolis.
San Francisco.
Bangor.
Quebec.
Toronto.
(One centre studied in sufficient detail for clearness, others compared.)
Transportation.
Distribution in country.
From the United States.
To the United States.
Mining Regions.
Coal. (Appalachian Mountains.)
Extent of fields.
Coal beds.
Size of mines.
(Other coal fields compared.)
Centres of coal trade.
Chicago.
Philadelphia.
Pittsburg.
Erie.
St. Louis.
Buffalo, etc.
Reasons for the centres.
Location with reference to coal fields.
With reference to ease of transportation.

Effect of coal supply upon centres.
Transportation.
Routes by which coal is sent to centres.
Routes of distribution.
Iron. (Appalachian Mountains.)
Extent of iron fields.
Iron mining.
Compare with coal mining.
(Other iron regions noted and compared.)
Relation between iron mining region and coal mining.
Iron manufacturing centres.
Chicago.
Philadelphia.
Pittsburg, etc.
Reason for this industry in these cities.
Transportation.
From iron regions to centres.
Distribution of finished products.
Petroleum.
Extent of oil fields.
How petroleum is obtained.
Centres refining it.
Cleveland.
Philadelphia.
Transportation.
Modes of transportation from oil fields to centres refining it.
Distribution to various parts of the United States and abroad.
(Same plan for gold, silver, copper, and building stones.)
Fisheries.
Newfoundland " Banks."
Location in regard to continent.
Heat belt.
Extent.
Fishing voyages. (See Nature Study Course, *loc. cit.*, p. 22.)
(Compare with conditions found off coast of Norway.)
Other fisheries of North America noted and compared.
Centres of fish trade and manufacture.
Baltimore.
Gloucester.
Seattle.
Halifax.
St. Johns.
Victoria.
Transportation.
Routes by which fish reach these centres.
Routes of distribution.

Commercial Centres.
  Position of New York City studied in detail, noting:
    Its nearness to sources of supply.
    The extent of country on which it can draw, etc.
    Its facilities for transportation.
    Its relation to European ports.
  Compare other great commercial centres.
    San Francisco.
    Chicago.
    Boston.
    New Orleans.
    Philadelphia, with New York in these respects, noting advantages of each.
Scenic Centres.
  Adirondacks.
    Extent of region.
    Appearance.
      Height of mountains.
      Immensity of forests.
      Mountain lakes.
      Winding streams.
    Life in the woods.
      Trails.
      Camps.
      Hunting, fishing, canoeing, etc. (See course in Nature Study, *loc. cit.*, p. 20.)
    Value of such regions.
      For growing in sympathy with nature.
      For restoration of health.
      For rest to be found.
      For recreation.

In a similar manner study such centres as the White Mountains, Catskills, Atlantic City, Niagara Falls, Yellowstone Park, Canyon of Colorado, Los Angeles, etc.

Observational Work Parallel to Earlier Portion of Stage III

Forms of Moisture.
  Explain that evaporation takes place from ponds, lakes, rivers, oceans, etc. Impress the thought of the great amount of moisture carried up daily.
  Invisible moisture.
  Visible. — Transformation of vapor into clouds.
    Classes of clouds.
      Cirrus, stratus, cumulus, nimbus.
    Note appearance, altitude, and formation of each class, also

weather conditions or time of day with which each is associated.
Direction and rapidity of movement observed.
Fog.
Formation. — Compare with cloud formation.
Effect of sun upon fog.
Rain.
Shape and size of drops. Amount of precipitation measured after a storm.
Work of rain.
Snow.
Flakes. — Shapes, sizes, formation, crystallization of salt, sugar, etc., observed.
Snowfall measured. — Use of snow.
Hail.
Shape and size of hailstones.
Formation.
Effects.
Dew.
Appearance of grassy field in early morning recalled; later in day.
Formation of dew.
Chill pitcher of water in room. — Allow it to grow warm. — Formation and disappearance of dew noted.
Effect of clouds upon formation of dew. — Effect of winds.
Formation of dew on mountain summits and in valleys compared.
Frost.
Its formation.
Protection of vegetation against frost.
Its work.

Sun.
Review work of preceding stage on the relation of the earth to the sun.
Note when sun rises and sets exactly in east and west. (Length of day and night at this time.)
Variation from these points according to season.
Slant of sun's rays measured at various periods throughout the year. — Variations noted and explained.
Angle compared with length of day and with temperature.

Eurasia

Eurasia is studied in the fifth grade from the same standpoint as North America in the fourth grade, so that by the close of the work of Stage III the pupils have received a good founda-

tion for the emphasis of physical controls that is to come in later stages. Through the constant comparisons and relations that are emphasized between the new work and that which has preceded, a good perspective is given, and a knowledge of location is gained by the pupils almost unconsciously. As an aid in visualizing relative positions all the leading centres, the principal trade routes, and towns are filled in on blank outline maps by the pupils. The method is such that the pupils' knowledge is continually being used, so that reviews are constant, and the continued emphasis of life conditions keeps the class easily and sanely interested in the work. Parallel with the continental work is a series of exercises in observational geography that is aimed to give training in observation, and to help lay a foundation in knowledge for a later, more appreciative study of certain phases of physical geography. This work is much assisted by a portion of the Nature Study work of the grade, which is devoted to Heat. (See Course in Nature Study, *loc. cit.*, pp. 24-28.)

The history work for the grade is the ancient history of Greece and Rome, making it possible to have the history help the geography, and the geography help the history to an equal degree. Much time can be saved in each subject by the method followed.

Position.
  Direction from United States.
  Latitude and longitude.
Climate.
  Heat belts.
    Compare with North America.
  Winds.
    Direction.
    Influence upon temperature.
  Rainfall.
    Effect of mountains upon rainfall. Compare coast and interior of Scandinavia, of Spain, of India, etc.
Agricultural sections.
  Recall conditions found favorable for agriculture in North America.
    From a study of maps select regions which are adapted to agriculture in regard to
      Slope.
      Soil.
      Temperature.
      Rainfall.

Study the tundras, desert regions, etc., noting conditions which are lacking, effect upon plant life, animal life, and man.

Selection of regions in which essentials for agriculture are found.

Northern lowland, from Atlantic through Southern Russia and Southern Siberia.

Valleys of Danube, Po, Rhone, etc.

Southern Europe.

Asia Minor, China, Japan, Korea, India, etc.

(Note differences in climatic conditions. — Differences in products to be expected.)

Wheat.

Recall conditions favorable for growth of wheat in North America.

Probable location of wheat fields.

Countries in which essential conditions are found:

Russia (black earth region), Austria-Hungary, Balkan States, France, Germany, Denmark, England, India, etc.

Compare latitude of sections studied with latitude of wheat-growing section in America. Note variations in climate and topography in sections studied. — Effect upon crops. — Conditions most favorable for growth of wheat.

Comparisons of amount of wheat raised in Eurasia and North America; in Russia and remainder of Eurasia. Comparisons of population (as a result of these comparisons show that in general wheat must be bought by Western Europe, — sold by United States and Russia).

Wheat markets.

Odessa, Bombay, Budapest, Danzig, St. Petersburg, etc.

Account for above.

Location in regard to wheat regions.

Ease of transportation.

Routes of transportation.

From wheat sections to ports.

From ports to various parts of the world.

(From study of physical maps decide upon probable routes of exportation, verifying conclusions from commercial maps. — Note seas, rivers, canals, chief railroads, etc. Compare advantages of Northern and Southern ports.)

Flax.

Nature of flax. — Its use.

Conditions favorable for growth in regard to slope, soil, temperature, rainfall.

Where found.

Ireland, Belgium, Netherlands, France, Germany, Austria, Italy, Russia, etc.
Cultivation of flax.
Compare production of Eurasia with that of North America. — Reason for difference.
Flax area compared in extent with cotton section of the United States.
Centres of manufacture and exportation:
Belfast, Ghent, Riga, St. Petersburg, Lille, etc.
Account for above.
Location in regard to flax districts.
In regard to mining regions.
In regard to ease of transportation, etc.
Routes of transportation as before.

Mulberry.
Reasons for cultivation.
Conditions favorable for growth.
Where found.
France, Italy, Japan, China, India, etc.
Cultivation of mulberry.
Range of climate.
Compare extent of cultivation with that of United States.
Reasons for difference.
Centres of manufacture and export.
Lyons, Havre, Marseilles, Krefeld, Milan, Shanghai, Canton, Tokyo, Yokohama, etc.
Reasons for centres.
Vicinity to mulberry region.
Facilities for manufacture.
Ease of transportation, etc.
Routes of transportation.
From Japan to United States; Italy to Germany, — to Switzerland; France to United States; China to Great Britain, etc.
(Physical and commercial maps used as above.)

Grapes.
Value of the vine.
Conditions essential for growth.
Where found.
France, Germany, Italy, Spain, Austria-Hungary, etc.
Vineyards.
Their location. — Why southern slopes are preferred.
Description of vineyards. — Life in connection.
Centres of manufacture and exportation.
Cadiz, Lisbon, Oporto, Bordeaux, Malaga, Marseilles, Cologne, Vienna, etc.
Reasons for above.
Routes as before.

(Same plan for rye, sugar-beet, hops, tea, etc.)

Grazing.

Recall conditions found favorable for grazing in North America.

Location of grazing regions of Eurasia.

Among Alps. — Other highland regions.

Through British Isles, Netherlands, Plains of Hungary, Southern Russia, Southern Siberia.

Portions of Asiatic Turkey, Arabia, Persia, Afghanistan, Beluchistan, etc.

Grazing among Alps and occupations dependent recalled.

Compare with grazing in North America.

Grazing in Holland studied, noting:

Conditions under which it is carried on, — elevation, slope, etc. Comparison with conditions observed among Alps, — with grazing regions of North America.

Life in connection compared with life among Alps, — with life of Western plains.

(Other grazing regions of Europe noted.)

Grazing products of Europe.

European centres of manufacture and exportation.

Rotterdam, Cork, Copenhagen, Budapest, Odessa, Ghent, Brussels, Leeds, Elberfeld, etc. Show industry of towns to be dependent upon

Accessibility of raw products.

Vicinity to markets demanding products.

Ease of transportation, etc.

(Show advantage of accessibility of coal and iron.)

European routes of transportation.

Grazing in Asiatic Turkey, Arabia, Persia, Afghanistan, Beluchistan, compared with regions studied, noting:

Climatic conditions.

Slope, soil.

Herds.

Life in connection.

Grazing products of Asia compared with those of Europe.

Asiatic centres of exportation and manufacture.

Smyrna, Bagdad, Mecca, etc.

Account for Asiatic centres.

Manufacturing of carpets, shawls, etc., compared with manufacturing in sections previously studied.

Asiatic routes of transportation. — Methods.

Lumbering.

Conditions found favorable for lumbering in North America.

Location of lumbering regions.

Forest belt of Northern Eurasia.

Highlands of Southern Europe.

Central India, Siam, etc.

Forest belt of Northern Eurasia studied in detail, noting:
Extent of region.
Slope, soil, climate.
Kinds of wood.
Uses.
(Compare with lumbering in North America.)
Other lumber sections compared.
Lumber centres.
St. Petersburg, Riga, Christiania, Gothenburg, Archangel, Bombay, Rangoon, etc.
Account for industry of centres studied.
Routes of transportation.
Mining.
Regions generally adapted to mining in North America.
Probable location of mining in Eurasia.
Regions in which coal and iron are found.
Great Britain, Germany, Belgium, France, Ural Mountains, other highland regions, China, Japan, etc.
Special study of those districts combining coal and iron, noting:
Richness of deposits.
Productiveness. — Compare with United States. — Compare Great Britain and China. — Account for difference. — Effect upon industries of countries.
Advantage arising from the combination of coal and iron.
Facilities for transportation.
Centres of export and manufacture.
Glasgow, Manchester, Birmingham, Cardiff, Liverpool, London, Hamburg, etc.
Account for special industries of centres, e.g.:
Glasgow. — Iron steamships.
Vicinity to coal and iron.
Vicinity to sea.
Manchester. — Cotton.
Vicinity to coal and iron.
Vicinity to port receiving raw cotton.
Ease of transportation, etc.
Brussels. — Carpets.
Vicinity to flax region.
Vicinity to wool-growing section.
Vicinity to coal and iron.
Ease of transportation, etc.
Routes of transportation.
From coal and iron sections to manufacturing centres.
From manufacturing centres to ports.
From ports to various parts of the world.
(Same plan for petroleum, copper, gold, etc.)

Fishing.
  Conditions found essential in North America.
  Probable location of fishing banks.
  Fishing areas.
    Northwest coast of Eurasia.
    Southwest coast of Eurasia.
    Mediterranean.
    North Sea.
    North Pacific.
  Study each section, noting:
    Depth of water.
    Heat belt.
    Kind of fish. — Mode of fishing.
    Extent of shoals, etc.
      (Comparison with Newfoundland Banks.)
  Centres of fish trade.
    Bergen, Bordeaux, London, Hull, etc.
  Reasons for centres.
  Routes of transportation.
Summarize preceding topics by a study of commercial centres.
  Study centres as London, Liverpool, Manchester, Glasgow, Hamburg, Berlin, Cologne, Havre, Lyons, Paris, St. Petersburg, Vienna, Bombay, Calcutta, Canton, Peking, Tokyo, etc., noting:
    Size.
    Location. — Relation between size and location.
    Special industries.
    Relation to other great centres.
    Facilities for obtaining raw products, — for exporting finished products, etc.
      (In each centre studied bring together the elements which have combined to make the centre an important one.)
Scenic Centres.
  Regions visited by tourists.
    Alps.
    Mountains of Norway.
    Mount Vesuvius.
    Venice.
    The Rhine, etc.
  The Rhine.
    Its source. — Fed by glaciers.
    Its length.
    Character of stream.
      Upper Rhine.
      Middle Rhine.
      Lower Rhine.
        Each portion fully described, noting:
          Width and volume of stream. — Lakes, rapids, falls.

— Banks, their height. — Forested areas along stream. — Vineyards. — Ruins, etc.
Position of the Rhine as a scenic centre.
Comparison with Hudson.
(Other scenic centres studied in a similar manner.)

Observational Work Parallel to Later Portions of Stage III

Continue observational work on sun's position in sky as noted for earlier portion of Stage III.

Choose a month in fall, winter, early spring, late spring, noting phenomena connected with the season, accounting for same, i.e.:
December.
Short days. — Their length.
Long nights. — Their length.
Length of noon shadow.
Limit of sunshine.
Low temperature.
Kind of precipitation, etc.
Moon.
Time of rising of moon. — Time of rising as moon grows old. — Reason.
Reason for change in appearance of moon. (Position in regard to earth and sun explained.)

Stage IV

Sixth grade, three periods of forty minutes each; seventh grade, three periods of thirty-five minutes each.

As will be readily seen by those who have followed the course thus far outlined, increasing emphasis has constantly been laid upon the importance of the physical side in geography. In Stage III our aim was to introduce the pupil gradually to the real importance of physical controls in determining or influencing life conditions, so that he would be prepared to take up the study of these topics as worthy of special treatment. In Stage IV the topics in reference to climate, latitude, longitude, etc., that have been touched upon, especially in the observational work and in the related Nature Study of Stages II and III, are brought together, related, reviewed, and strengthened, with a view to using the generalizations thus developed in a

study of the more important continents from the physical standpoint.

All the physical controls that will be used in the later work of Stage IV are not, however, considered in detail before being applied to some particular continent. Those elements of climate and of mathematical geography touched upon in the earlier stages that are fundamental in a causal study of any continent are first taken up. They are then applied to the study of Africa. The other physical features such as land forms, ocean currents, etc., whose effects are better seen in detail than in general, are considered as need for them arises. Thus by the time Africa has been covered fully, the class are ready to take up the later continents entirely from the physical standpoint, outlining at once the several broad features of position, climate, topography, etc., that are of importance in determining general conditions. They can then pass to special conditions as largely the result of local physical conditions with understanding and profit.

This method, when properly put in operation, demands a use of physical geography that renders it unnecessary to have a special course in physical geography in the earlier high school years. Many facts must, of course, be omitted that might be included in a first year high school course; but all the necessary physical controls of life may be studied scientifically and thoroughly, and made permanently of value through being applied and used in every-day school work, so that the scientific study of physical geography as such may be deferred until the later years of the secondary schools. Such a plan, furthermore, allows the best ideas in reference to geography teaching to be woven together in such a way as to prevent one-sidedness, while ensuring good, thought-provoking work that is of practical, every-day value, and, further, that lays the foundation for later, better work. With such a plan, neither the physical geographer, the commercial geographer, nor the sociologist can rightfully claim that the pertinent facts of his field have been neglected until the children are dulled to their beauty and importance.

The working out of a course of study so that the attention given physical geography shall gradually be increased in amount and in significance as the years advance is not an easy task. From the whole field of physical geography there must be selected those facts that are of the greatest value; these facts must

be arranged so that progress is assured without over-repetition, and must be related to the conditions of which they are the causes so that the knowledge of both causes and consequences is enriched through such a causal study.

The history work in Grade VI is mediæval history up to the age of discovery, which is naturally based on the geography work of Stage III. The Nature Study work of the sixth grade is in part devoted to the properties of air, which is of especial value in assisting the study of climate. (See Course in Nature Study, *loc. cit.*, pp. 33-35.) In fact, the work of the two courses in this particular cannot be separated. It might with equal propriety be called all Nature Study or all Geography.

The Nature Study work of Grade VII is in part devoted to the distribution of plants. (See Course in Nature Study, *loc. cit.*, pp. 37-38.) This work is based directly on the facts of climate and topography already acquired in the geography course, and at the same time assists the geography work in bringing out from a biological standpoint the effects of the physical environment that must be considered in geography work largely from the physical or earth standpoint.

The history work of the grade and of the last grade of the elementary school being entirely American history, is directly based on the geography of North America and especially that of the United States. In fact, during a part of the seventh grade, the work in these two subjects can go hand in hand, and in treating the geography of the different physical regions of North America those divisions are taken up in the order that best aids the study of colonial history.

The Course in Outline

Direction and Distance.
- Compass points in schoolroom: north and south line.
- Development of meaning and use of latitude based on observations of previous grades continued in this grade.
- Development of meaning and use of longitude and time in a similar way. — Standard time.
- Measurement of distance by degrees of latitude and longitude.

Area and representation of area.
- Plans and maps.
- Study of scales of representation.
- Meaning and use of common maps continued. Map of schoolroom to several scales.

Weather.
Weather conditions in New York.
Wind and temperature at different seasons.
Wind and rainfall at different seasons.
Relation of cloudiness and fair weather to winds and temperature.
Study of weather elements of selected days that illustrate weather of other climatic belts.
Study of average weather conditions for a month, based on class and individual observations.
Representation of weather on weather maps.[1]
Study of weather maps for wind, temperature, and isotherms.
Climate.
Study of the distribution and climatic features of great wind belts of world, based on study of form and motions of world, which is in part developed from observational work of previous grades. Work to be in part an outgrowth of study of Africa (see below). (See also Course on Nature Study, *loc. cit.*, pp. 33-35).
Distribution of greater land masses of world in reference to wind systems. Comparison of several wind belts, and of land and water portions of each.

Africa

Location of Africa in direction from schoolroom; in latitude and longitude. How would we go from New York to Algiers. To Cape Town? Shape and size of Africa; map representation of Africa.
Climate.
Distribution of temperature in summer and winter as shown by isotherms.
Annual range of temperature — in Congo basin, at Cairo, at Cape Town.
Preliminary.
Division of Africa into habitable zones according to temperature.[2]

[1] The blank weather maps used can be obtained from the United States Weather Bureau for a very small sum, approximately $1.55 per 1000. These maps are also of great service for use as outline maps in the study of the general geography of the United States.

[2] Throughout the continental work extensive use is made of outline maps in representing the distribution of different phenomena. Thus training is given in the visualization of locations, which is believed to be superior to that gained where pupils make their own maps. The only training in map drawing that is given in the course is in reference to projections so that the pupils may understand maps of large area. Map

Distribution of rainfall by seasons. Distribution of rainy and desert areas.
Relation of rainfall areas to general and seasonal winds.
Distribution of highlands and lowlands in reference to winds.
Influence of highlands and of lowlands upon rainfall and temperature.

Surface.
Plateau character of region and general absence of lowlands.
Introduce idea of aging of land forms and advantages and disadvantages of a little-dissected plateau.
General distribution of highlands, comparison of Northern and Southern Africa as to average height.
Effects of highlands upon temperature, rainfall, etc.
The Atlas mountains, their distribution, general character, and importance.
The principal features of mountains. Character and relation to life of young and old mountains.
The highlands of Abyssinia.
The Great Rift Valley. Its formation, peculiar features, and importance.
The volcanoes of East Africa.

Coast Line.
Advantages to a continent of ready access to ocean, from standpoints of climate, commerce, defence.
Ideal coast line. — Review of features and importance of coast line of Europe.
Coast line of Africa.
Its regularity, its relation to interior plateau and coastal lowlands, where they occur.
Gulfs, capes, and islands of Africa located and described. Relation of Madagascar to mainland.
Importance of northern coast of Africa in ancient times, of western coast ports in slave and ivory trade, and southern coast to English and Dutch.

Drainage.
The position of the larger rivers and lakes of Africa, both in reference to climatic divisions and to highlands.
Important features of rivers from human standpoint; length, large volume, gentle slope, absence of falls, favorable location climatically.
Failure of African rivers in certain of these particulars. Effect of presence of waterfalls.
Absence of great highway into interior of continent.
The Congo Basin.
Position and chief divisions.

drawing and modelling are reduced to a minimum, but great attention is given to the filling in of details on blank outline maps.

Size and volume. Relative size as compared with Amazon and Mississippi.
Relation to rainfall.
Character of its different divisions. — Tanganyika, Stanley's Pool.
History of discovery and exploration; present mastery of Congo.
Chief products of Congo Basin. Character of native peoples.
The Nile Basin.
Position, volume, and divisions of Nile.
Relation to rainfall and topography. Necessity for irrigation. Its effect on life habits.
Absence of tributaries in lower portions of Nile; reasons therefor.
The alluvial plain.
Its origin, character, and importance.
Idea of aging of stream developed; aggrading and degrading work of rivers worked out; value of old rivers.
The Delta.
Its growth and reasons therefor.
Origin and character of waste.
The principal distributaries and their character.
Significance of location of Cairo and Alexandria.
Their importance historically.
Vegetation Regions of Africa.
Distribution of vegetation regions according to latitude.
The Mediterranean and the Cape regions.
The Sahara and the Kalahari Deserts.
The Savannas and Wet Jungles.
The Mediterranean Region.
Review of topographic features and climatic location.
General character of vegetation.
The leading products and occupations of peoples as related to topography and climate.
The distribution of peoples and the division of the area politically.
Leading cities located and studied, including Tangiers, Fez, Algiers, Tunis, Tripoli.
The Cape Region, considered as above, including account of present South African conditions. Compare with Mediterranean Region in as many ways as possible.
Means of communication and commerce considered, including telegraph lines, Cape-Cairo Railroad, etc.
Leading cities studied, Cape Town, Cape Elizabeth, Kimberley, Johannesburg, Pretoria.
The Sahara.
Location and extent. Relative size compared, for instance, to Europe.

Location in reference to wind systems and rain belt.
Origin of deserts considered. Sahara a *dry* desert.
Desert conditions. Absence of moisture, of rainfall, rapid and great changes of temperature, wind erosion, dry stream beds (wadis), general absence of vegetation, oases, etc.
Means of migration and leading caravan routes and races occupying the Sahara.
Surface features of Sahara; drainage lines, and relation to Nile.
Products of Sahara, in kind and in value.
Sahara as a great barrier.
The Kalahari Desert.
Compared in position, in character, in products, etc., with the Sahara.
The Savannas and Jungles of Equatorial Africa.
Location, climate, and rainfall.
Character of surface, leading mountain ranges.
Distribution of forested and grassy areas in reference to climate and topography.
The steppes bordering the savannas.
Great drainage lines compared with Congo.
Products, native peoples, and political divisions of tropical Africa. Special treatment of the Sudan.
Summary.
Political divisions of Africa. Colonies in Africa.
Distribution of native races.
Importance of Africa politically and commercially.

Australia

Location in latitude and longitude.
Location in heat belts and wind systems.
Area as compared with Europe.
Why a continent rather than an island.
Relation to Asia and Australasia.
Coast line.
Continental shelf.
Larger indentations of Gulf of Carpentaria and Great Australian Bight.
Comparison of eastern with western and southern coasts.
Extent and importance of Great Barrier Reef.
Physical Features.
Extent, height, and character of eastern highlands.
Drainage lines determined by highlands.
Lowlands of southeast.
Western plateaus and deserts.

Climate.
- Expected climate according to position and relief.
- Climatic features as determined from isotherm and rainfall maps.
- Effects of eastern highlands on temperature and humidity.
- Distribution of rainfall; extent of western desert.

Products.
- The animals of Australia compared with those of other continents.
- The plants and their distribution according to climate and topography; the wheat and sheep industries.
- Other economic products, such as gold, copper, iron.

People and Industries.
- Character, distribution, and occupations of native races.
- Leading occupations of people, exports, and chief trade centres.
- Location and importance of larger commercial cities, i.e., Sydney, Melbourne, Brisbane, Adelaide, Perth.
- Distribution of peoples, railways, telegraphs, etc., as related to climatic and topographic features.

Political Divisions.
- Present political divisions and development of Australian Commonwealth.
- Comparison with South Africa in physical and political conditions.

Related Islands.
- Treat Tasmania and New Zealand briefly as to:
  - Location, relation to Australia, climate, products, and importance.

North America

Location by latitude and longitude and relation to Europe. Size and general form.
- Larger features.
  - Eastern and western highlands.
  - Central and coastal plains.
  - Height of land.
- Consequent lines of drainage.
  - Arctic drainage.
  - Pacific drainage.
  - Atlantic drainage.
    - Direct.
    - St. Lawrence.
    - Gulf.
  - Interior drainage.
- Comparison of coast line on east and west — as to general form, number of harbors, temperature of harbors in winter, nearness to foreign markets.

Climate.
- Distribution of North America in reference to winds.
- Summer and winter distribution and range of temperature.
- Influence of ocean in equalizing conditions.
- Relation to ocean currents.
  - Develop scheme of ocean currents, as related to temperature and winds.
  - The North Atlantic drift compared to other drifts.
  - The Gulf Stream and Labrador current.
- Range of temperature along Atlantic coast as determined by position in lee of continent and in relation to contrasted ocean currents.
- Distribution of rainfall as influenced by:
  - Prevailing winds.
  - Proximity of ocean.
  - Presence of great land barriers.
- Products.
  - Relation of vegetation regions to climate and topography.
  - Relation of distribution of animal life to food supplies.
- Population.
  - Distribution of population as compared to climate, topography, drainage lines and coast line.

Detailed Study of the United States

New England.
- Distribution of upland and lowland.
  - Character and extent of, and general effects of, on distribution of peoples and occupations.
  - Principal lines of drainage and importance.
  - Glaciation and its effects.
    - On uplands as to soil and habitability.
    - On lowlands as to soil, topography, and general habitability.
      - Principal centres of colonization and reasons therefor.
      - The resources and history of the Connecticut Valley.
    - On drainage.
      - Gorges.
      - Waterfalls and power; the valley of the Merrimac being studied in detail.
      - Lakes, as reservoirs, as moderators of climate, as health and pleasure resorts.
- Leading industries and products.
  - Lumbering and fishing.
  - Manufacturing.
  - Market gardening.
    - General character of each industry, with its location and

the leading cities engaged in the industry. Special study of growth and importance of Boston.

Commerce routes.

Land and water routes used commercially, and as related to topography.

Effect of topography on Western trade.

New York State.

Distribution of Highlands and Alleghany Plateau.

Character of uplands as in New England.

Brief summary of geological history of New York State.

The valley of the Hudson and of the Mohawk.

The climate of uplands and lowlands, of lake plains and coastal regions.

Principal lines of drainage and relation to topography.

The resources of New York State to be worked out from knowledge of topography and climate, and then verified in details.

Products of soil of Mohawk lowland and Long Island Plain, with special emphasis on hay, corn, hops, and truck farming.

Vineyards of lake region of Cattaraugus and Chautauqua Counties.

Dairying of St. Lawrence, Jefferson, Delaware, Oneida, and Orange Counties.

Forests of Adirondack Highlands and Alleghany Plateau.

Value of forests for lumber, wood pulp, as health and pleasure resorts. Influence of lakes in highlands.

Marble, building stone, cement, oil, etc., of Alleghany Plateau.

Salt of Onandaga County.

Mineral springs of Livingston and Saratoga Counties.

Fishing of lakes, Hudson river, and ocean, especially white fish, shad, oysters, clams, and menhaden.

Manufacturing of Buffalo, Syracuse, Troy, Binghamton, Little Falls, Glens Falls, etc.

Commerce of New York, Buffalo, Brooklyn, etc.

Leading commerce and transportation routes, considered historically and in present conditions.

Influence of climate, topography, and drainage on development of New York State.

Especial study of salient features of New York City and vicinity, including eastern New Jersey and western Connecticut. This work is largely based on a series of field excursions to various localities: to Bronx Park, to study topography and drainage; to Palisades of the Hudson, for a similar purpose; to an importer's warehouse, or to an ocean steamer for a study of commerce; and to the coal wharves and beef packing establishments at Manhattanville, to study these industries as determined in location by the physical features of their vicinity.

Atlantic Coastal Plain.
- Boundaries of coastal plain on land and on water side. Fall line.
- Extent of plain, by states and parts of states.
- Climate of plain, summer and winter. Variation in climate.
- General character of plain, as to soil, slope, lines of drainage, amount of aging, etc.
- Recent history of plain and how determined.
- Shore line and drowned valleys. Importance of these in history.
  - Present use of shore line.
- Distribution of economic products of plain, with especial attention to agricultural products, such as tobacco, cotton, rice, oranges, etc.; to mineral products, such as phosphate, sands, clay, etc.; to forest products, such as lumber, resin, etc.
- Influence of these conditions on colonization and manner of life in colonial times.
- Distribution of leading cities.
  - Coastal cities: Atlantic City, N. J., Norfolk, Va., Wilmington, N. C., Charleston, S. C., Savannah, Ga., Tampa, Fla.
  - Cities near "fall line": Trenton, N. J., Philadelphia, Pa., Baltimore, Md., Washington, D. C., Richmond, Va., Raleigh, N. C., Columbia, S. C. Influence of estuarine conditions in reference to certain of these.
- Particular study of coastal area of New Jersey.
  - Relation of coastal area to old land area.
  - Distribution of topography and soils, as seen in lowland, ridges, plain, and beach.
  - Distribution of occupations and people in these areas.
  - Influence of topography on lines of communication, especially in reference to New York, Philadelphia, and the South.

The Appalachian Region.
- Distribution of Appalachian region by states.
- Boundaries of region on east and west, on north and south.
- The area as a highland, influencing:
  - Climate and vegetation.
  - Drainage lines.
  - Distribution of peoples.
  - Migration of peoples.
- The division of the area into —
  - Old land belt.
  - Great Valley.
  - Alleghany Plateau.
- Distribution and topographic features of these divisions, including brief summary of geological history of the region.

Special study of geography of Pennsylvania.
Topographic character of each great division in Pennsylvania.
Drainage of Pennsylvania as seen in Susquehanna and Alleghany rivers.
The importance of water gaps of Delaware and Susquehanna rivers.
On development of state historically.
On development of interior of continent.
On commerce by rail and water.
Distribution of soils and minerals according to topographic divisions.
Reasons for development of coal and iron mining and steel manufacturing.
Reasons for importance of leading cities: Pittsburg, Scranton, Reading, Bethlehem, Philadelphia.
Location and importance of water gaps in southern Appalachians.
Influence of drainage lines on development of region.
Principal products of region, and distribution thereof, especially coal, iron, oil, and lumber.
Location and importance of leading cities, such as Wheeling and Parkersburg, W. Va., Chattanooga and Knoxville, Tenn., Birmingham, Ala., Asheville, N. C., Atlanta, Ga.
Detailed study of vicinity of Chattanooga, Tenn., with especial emphasis of relation of topography to the incidents of the Civil War.
Gulf Plain.
Distribution of Gulf Plain by states.
Relation to Mississippi river and to Atlantic Plain.
Climate of region, with especial note of rainfall and summer temperature.
Shore line features.
Drainage of plain.
Soil and topography, and influence on agriculture. Special study of soil features of Mississippi river, an old river plain.
Principal agricultural products and their distribution.
Relative importance and conditions of principal cities: Pensacola, Fla., Mobile, Ala., Vicksburg, Miss., New Orleans, La., Galveston and Houston, Tex.
Prairies and Great Plains.
Distribution of region as a whole, including extension into Canada.
Climate of region, with particular emphasis of summer and winter temperatures and winds; distribution and amount of rainfall.
Division of regions climatically into Prairies and Great Plains.

Prairies.
- The Prairie States, their position and importance.
- Topographic features of Prairie States.
- The soil and drainage of the prairies.
- Other features of the Prairie States, especially Michigan, Minnesota, Wisconsin, and Missouri.
- The distribution and value of leading agricultural products.
- Lines of transportation and commerce.
  - The Great Lakes and navigable rivers.
  - The leading railroad lines and relation to topography.
- The leading cities of area, related to their environment, especially Cleveland and Cincinnati, O., Louisville, Ky., Detroit, Mich., Chicago, Ill., Milwaukee, Wis., St. Paul and Minneapolis, Minn., Omaha, Neb., Kansas City and St. Louis, Mo.
  - Detailed study of geographic conditions of Chicago, and reasons therefor.

The Plains.
- Distribution of plains, and relation to prairies and Rocky Mountains.
- Detailed consideration of climate of plains.
- Topographic features of plains, and character of drainage.
- Industries of plains as related to topography and climate. Methods and results of irrigation.
- Cities of plains, especially Great Falls, Mont., Cheyenne, Wyo., Denver and Pueblo, Colo.

Rocky Mountains.
- Alignment and extent of Rocky Mountains.
- Relation to Cordilleras, and extension into Canada.
- Distribution of heights in Rocky Mountains; relation of heights to continental divide.
- Influence of height on climate and vegetation and transportation. The principal railway lines and passes.
- Effect of mountains on climate of plains.
- Scenic features of the region, especially the Yellowstone Park, the Colorado "Parks," and leading mountain peaks of Colorado.
- The principal mining centres of the mountains, their location and importance.
- The leading cities and their characteristics: Butte and Helena, Mont., Laramie, Wyo., Leadville and Cripple Creek, Colo.

The Great Basin.
- The extent and climatic features of the Great Basin; relation to Columbia and Colorado Plateaus.
- Reasons for climate of area.
- Recent climatic history of area, in brief, with especial reference to Great Salt Lake.
- Industries of region. Importance of irrigation.

Salt Lake City and its history.
The Colorado Plateaus.
The extent and climate of the Colorado Plateaus. Influence of altitude on climate.
The topography and its origin.
The Colorado river and canyon; source of water; arrangement of tributaries. The size and grandeur of the canyon.
The industries of the region.
The inhabitants, both ancient and modern, with brief note of some of the Indian customs, like those of the Mokis.
The leading cities: Prescott, Phœnix, Tucson.
The Columbia Plateaus.
Character and extent of area.
Geological history of plateaus.
Climate and occupations of people.
The Pacific Ranges.
The extent and subdivisions of the area.
Sierra Nevada.
Cascade Mountains.
Coast Ranges.
California Valley.
Relation of the area to the Cordilleran Highland.
Influence of alignment and height of area upon climate. Effect upon interior regions.
Climatic conditions, summer and winter.
Relation to wind systems.
Distribution of rainfall by seasons, with special emphasis on Washington and Southern California.
Drainage of the area.
Importance of the Columbia, Sacramento, and San Joaquin Rivers.
The character of the shore line. Contrast with Atlantic shore line in form and in climate. Importance of Puget Sound and San Francisco Bay.
Brief history of the development of the region, including review of overland routes, first discovered and used. Present commerce and trade routes, both internal and external.
Products and occupations.
The distribution, character, and importance of forests as related to climate. The Big Trees of California.
The agricultural areas and their distribution.
The mining regions and their history in brief.
The fishing of the Columbia river, and its importance.
Special features of region.
The great mountains and dormant volcanoes.
Crater Lake.
The islands, and southern coast.
Cities and towns.

Seattle, Wash., Portland, Ore., San Francisco and Los Angeles, Cal.

The countries north of the United States.
- Topographic and climatic relation of Canada to the United States.
- Climatic divisions of Canada.
- The Provinces of Canada and their relative importance as determined by climatic position.
- The leading products of the several regions. The occupations and habits of the inhabitants.
- The great trade routes and leading cities.
- The position, climate, and topography of Alaska.
- Present interest in Alaska and reason therefor.
- The great rivers of Alaska and their importance.
- Leading industries of Alaska and importance to the United States.
- The position, character, and importance of Greenland.

The countries south of the United States.
- Topographic and climatic features of Mexico and Central America.
- Political divisions of Central America.
- Character of people.
- Products and occupations as determined by topography and climate.
- Commerce, both internal and external, and routes thereof.

The leading islands of the West Indies, and their importance to the United States.

The climate and products of Haiti, Cuba, and Porto Rico.

South America

Position.
- In reference to land mass.
- In reference to latitude and longitude — to oceans.

Climate.
- Trade wind and doldrum belts.
  - General features.
    - Direction of trades — their character — characteristics of doldrum belt — its extent — migration of belts — region of shifting doldrums and trades.
  - Rainfall. (Study physical maps and maps showing distribution of rainfall.)
    - Rainfall of trades and doldrums compared.
    - Comparison of eastern and western coasts and interior, of highlands and lowlands, of windward and leeward mountain slopes in trade wind belt.
    - Results of migration of doldrums and trades.

Rainfall of Orinoco — July and August, December and January.
Rainfall at head waters of Parana — Comparison with Orinoco.
Regions having two rainy and two dry seasons.
Temperature. (Isothermal map used.)
Temperature of trade wind and doldrum belts.
Heat equator for January and July located.
Temperature of eastern coast, of interior, of western coast compared.
Temperature of lowlands and highlands of same latitude. Winter and summer temperature of Lima, of Rio Janeiro, etc.
Sub-Tropical belt.
General features.
Region of shifting westerlies and trades. Direction of westerlies.
Reason for migration.
Rainfall.
Effect of these winds upon rainfall of countries, e.g., Chile — Season of greatest rainfall, of least — Comparison with countries in belts of shifting doldrums and trades.
Temperature.
Temperature of summer, of winter, of highlands, of lowlands.
Westerlies.
General features.
Region in which westerlies blow steadily — their character.
Rainfall.
Eastern and western coasts compared — Comparison with trade wind belt. Difference accounted for.
Temperature.
Temperature of summer and winter — temperature of coasts, of interior.
Surface.
Eastern highlands — Guiana, Brazil.
Central lowlands — Orinoco Plain, Amazon Plain, Paraguay — Parana Plain, Patagonia — Pampas Area.
Andes.
Guiana highland.
Surface features.
Extent, elevation, and character of highland.
Principal river — character of stream, of valley.
Topography compared with that of region directly north.
Climate.
Temperature.
Rainfall of northern and southern slopes.
Products of highlands — occupations.

Location of chief towns of Guiana accounted for. Explain absence of large towns in highlands (Guiana) of Venezuela — on adjacent coastal plain.

Brazilian highlands.

Surface features.

Extent of highlands, elevation — comparison of eastern and western slopes.

Influence of highlands upon rivers.

General direction of rivers — effect of barrier, e.g., São Francisco — character of rivers.

Climate.

Winds — temperature.

Rainfall of hot months — Precipitation during dry season.

Products and occupations.

Forests — Location accounted for.

Chief agricultural products — Region adapted to agriculture.

Grazing products — Region devoted to grazing.

Chief ports — Rio de Janeiro, Santos, Bahia, etc. Account for location.

Countries receiving products — Routes of transportation.

Andes.

Their extent — direction — region of greatest altitude, of greatest breadth.

Compare with Rocky Mountains, with Brazilian Highlands.

Southern Andes — including coast strip.

Character of mountains.

Character of coast — Irregularity accounted for — Comparison with similar coasts of North America.

Highest peaks located — their elevation — compare with country lying directly west. (Plain of middle Chile.)

Rivers flowing westward and eastward compared.

Climate.

Winds, temperature, rainfall.

Products.

Coal, gold, etc.

Forests (animal life of forests).

Grains and vineyards (Plain of Chile).

(Variations in topography and climate leading to differences in products and occupations shown.)

Chief port — account for location — routes of transportation.

Middle Andes.

Character of mountains.

Plateau of Bolivia — Its altitude, boundaries, northern and southern parts compared. Plateau compared with Great Basin (North America), with Andes of Peru.

Drainage.

Its character.
Former outlet of Lake Titicaca — size of lake — elevation.
Climate.
Compare climatic condition of desert of Atacama with eastern slope of Andes in same latitude — with country lying directly south.
Products and industries.
Mines — silver, copper, nitrate, etc.
Forests — rubber, cinchona.
Related industries, etc.
Chief commercial towns — routes of transportation.
Northern Andes.
Character of mountains.
Volcanoes — principal cones — nature of volcanoes — height.
Drainage — direction of streams — how determined.
Climate — influence upon location of towns.
Products — occupations.
Forest products —animal life of forests.
Products of mines.
Agricultural products.
Related occupations.
Commercial towns and commercial routes.
Amazon Plain.
Extent of basin — its character — direction of slopes.
Amazon river.
Size of river — navigability — main tributaries. Relative amount of detritus carried to sea. Alluvial deposits compared with deposits of Mississippi. Similarities and differences noted.
Climate.
Temperature — reason for amount of rainfall.
Relation of climate to life.
Favorable or unfavorable for man. (Map showing distribution of population.)
Animal life — varied forms — adaptation to environment.
Plant life — tropical forests — selvas described.
Products of forests.
Occupations — Methods by which natives obtain products.
Chief port for region. Destination of products. Commercial routes.
(Remaining lowland regions studied in a similar manner.)

Summarize work on South America by a brief survey of the leading countries, noting in each instance their extent, and identifying surface features, climate, and products with countries.

Stage V

Eighth Grade, three periods of thirty minutes each for first half year.

The last stage in the elementary course is devoted to a comparative study of the world from the physical standpoint, the continent of Eurasia being the basis of work. The object of the work is to give the pupils a comparative view of the salient features of the several continents. The continent of Eurasia is chosen as the medium through which the comparisons are made, because it is the most important of the continents next to the Americas, and hence offers an excellent opportunity for comparison with the other continents, particularly from the standpoint of physical control on life. Eurasia is not as simple a continent as Africa or Australia, for instance, and thus should be studied last, when the pupils are best able to understand exceptions to simple laws, and to appreciate deeper generalizations. Though the first object is a knowledge of Europe, the final aim is a related and well-ordered knowledge of the world as a whole, and especially of the broader geographical principles of human geography.

The method of comparing each large fact with similar facts in other continents allows the gradual building of generalizations that can be seen not to be absolute, and yet which give the very best point of view for pupils who are to pass into secondary work and the study of the elements of other sciences, which are best based on such a general point of view in reference to science as can be given by physical geography in the elementary school. In other words, the aim is to make the work of Stage IV reach a climax in Stage V that shall have a great culture as well as an informational value to the pupils.

Eurasia

Position, form, and size.
- Relation to land mass.
- Antipodal arrangement of land and water.
- Relation to oceans and ocean currents compared with North America and South America.
- Character of shore line noted.
- Compare in peninsularity with other continents; what may you infer therefrom?

Latitude and longitude. What does this suggest as to climate of interior and as to variation of climate with latitude?
Size compared with North America — with other continents. Relative proportions of Europe and Asia.

Climate.
Temperature.
Heat belts. (Isothermal maps used.)
Compare temperature of coasts and interior for January and July.
Compare east and west coasts, 40° N. Lat., with same points in western hemisphere.
Region of greatest extremes. Compare with North America. Cause suggested.
Coldest area. Compare with coldest area of North America in position and extent.
Winds.
Direction of prevailing winds in northern Eurasia — in southern Eurasia.
Relation of winds to highlands, compare with North America and Australia.
Rainfall.
Relation of rainfall to winds.
Region of greatest rainfall — of least rainfall. Comparison of these regions with similar regions in North America, in regard to extent, in regard to amount of precipitation, and in regard to line of greatest rainfall. Compare in a similar way to Africa.
Influence of topography upon rainfall — e.g., Himalayas, Central Asia, etc. Compare with Africa and Australia.

Topography.
Trend of great highland — Greatest altitude and breadth.
Position of highland in continent mass. Importance of highland as compared with the Americas.
Principal ranges — Compare with Andes and Cordilleras.
Northern lowland — elevation, character, and extent of surface.
Compare with North America in topography, position, and climate.

Drainage.
Principal rivers — compare in length, position, and importance with rivers of North America; with rivers of South America.
Inland seas — Characteristics — Influence commercially. Compare with Great Lakes of North America.

Vegetation and animal life.
Vegetation of northern Eurasia compared in character and in distribution with that of North America — animal life compared.

Great forest belt. Products of forest — animal life.
Steppes. Distribution and products of region. Compare with South America.
Deserts. Characteristic vegetation. Compare in position and origin with deserts of North America, of South America, of Africa, and of Australia.
Forests of southeastern Asia compared with northern forests. Animal life of region. Compare forests of Asia with those of Africa.
Animal and plant life of highlands compared with Africa and South America.
Minerals.
Regions in which minerals are most abundant. Chief mineral products compared in distribution with other minerals studied.
Great industries of Eurasia, and general distribution thereof.
Distribution of population accounted for from knowledge of climate — surface features.
Main commercial routes, both for internal and external commerce.

Europe

Position and relation to Asia briefly reviewed.
Relation to surrounding waters, as shown by continental shelf — significance of this in reference to France and British Isles.
Climate.
Temperature.
Heat belts — seasons of belts. (Isothermal maps used.)
Temperature of coasts and interior for July and January compared.
Temperature of western Europe compared with eastern North America.
Trend of isotherm of 30° F. for January explained.
Influence of Mediterranean on southern Europe.
Temperature range of eastern and western Europe compared.
Winds.
Prevailing winds of northern Europe — of southern Europe — Compare with North America.
Rainfall.
Regions of heaviest rainfall in northern Europe — in southern Europe.
Regions of lightest rainfall.
Season of heaviest rainfall of southern Europe accounted for. Compare with southern California, with South Australia, with middle western coast of South America.
Influence of topography upon rainfall.

Topography.
  Great physiographic divisions — northern and southern highlands compared, noting character, altitude, trend, etc.
  Chief highland regions — Alps and Himalayas compared — Scandinavian and Laurentian highlands compared.
  Extent of lowland.
Drainage.
  Control of rivers by topography — Exceptions noted — Comparison with condition found in North America.
  Drainage systems — Greatest rivers — Compare with great rivers of other continents.

On account of the complexity of structure a detailed treatment of Europe by countries seems advisable. The mode of treatment outlined below is typical for the various countries of Europe, each region being treated so far as possible by physical divisions.

Scotland (*an old mountain region*).

Position.
  Relation to Great Britain — to continent of Europe.
  Surrounding waters.
    Character of shore line — old shore line accounted for — shore line compared with Norway, Alaska, and New Zealand.
  Latitude extent.
    Region of corresponding latitude in North America.
Climate.
  Temperature.
    Compare with corresponding latitude in North America. Reason for difference found.
    Eastern and western coasts compared. Compare with British Columbia.
  Winds and rainfall.
  Direction of prevailing wind. Slopes receiving heaviest rainfall.
    Amount of seasonal distribution of rainfall.
Physical features.
  Highlands.
    Character, formation.
    Drainage — effect of glaciation. Compare with Maine, Massachusetts, etc.
      Principal rivers — their character, direction, etc. Lake basins and their influence.
    Effect of climate and topography upon character of people, upon occupations, upon distribution of population. Compare with New England.

Central lowland.
Topography of lowland — formation — evidences of vulcanism, of glaciation, of drowning. Compare with Connecticut valley.
Most important rivers— their courses.
Resources.
Fertility of soil.
Mineral wealth — iron and coal, etc.
Industries and exports.
Chief towns — location accounted for.
Population compared with highland region.
Influence of lowland in history.
Southern uplands.
Principal rivers.
Industries — control of topography shown. Exports.
Chief towns — their location.

Spanish Peninsula (a plateau)

Position.
With relation to continent, to surrounding bodies of water.
Latitude.
Region of corresponding latitude in North America.
Climate.
Compare temperature of coast and interior. Direction of prevailing winds, — winter and summer. Rainfall of coast, of interior. Compare with corresponding region in North America.
Topography.
Highlands.
Chief mountain ranges — their character, elevation, trend. Barrier between France and Spain (course of railroad noted).
Iberian Plateau. Character, general elevation. Effect on distribution of population. Madrid.
Lowlands.
Position, extent.
Compare highlands and lowlands with those of Africa. Contrast arrangement with highlands and lowlands of Australia.
Drainage.
Principal rivers — their directions — main divide.
Size of rivers on plateau accounted for — characteristics of rivers — reason for falls and rapids — basins of Douro and Tagus compared with Guadalquiver. Basins of North America similar to Douro and Tagus recalled.
Work of streams on eastern and western coasts accounted for.
Products and exports.

Influence of climate and topography upon vegetation — vegetation of plateau and coast compared and explained.
Animal products — regions devoted to grazing, to mining — products of mines. Chief exports.
Distribution of population.
Compare plateau and coast regions — Reasons for difference found.
Cities — commercial routes.
Centres of manufacturing, of commerce, etc.
Location of principal towns accounted for.
Routes of exportation.

France, Italy, Switzerland, and Greece treated in a similar way, and the countries of the northern plain treated as a unit as to general features and then divided for special consideration.

Summarize by generalizations in reference to the relation of life and occupation to position, climate, coasts, old and young rivers, dissected and non-dissected mountains and plateaus, coastal plains, etc., as shown by study of all the continents.

Texts Used in Several Stages

Stages I and II.
Around the World Readers. First and Second Book.
Stage III.
Tarr & McMurry, *North America.*
Longmans, *New School Atlas.*
Redway & Hinman, *Natural Elementary Geography.*
Stage IV.
Longmans, *New School Atlas.*
Redway & Hinman, *Natural Advanced Geography.*
Stage V.
Lyde, *Europe.* A. and C. Black.
Longmans, *New School Atlas.*

Selected List of Reference Reading Available for Pupils

Stages I and II.
Payne, *Geographical Nature Study.* American Book Co.
World and Its People. Vols. I and II. Silver, Burdett & Co.
Around the World Readers. Books I and II. The Morse Company.
Andrews, *Seven Little Sisters.* Ginn & Co.
Andrews, *Ten Boys.* Ginn & Co.
Andrews, *Each and All.* Lee & Shepard.

King, *Picturesque Geographical Readers.* First Book. Lee & Shepard.
Olive Thorne Miller, *Little People of Asia.* E. P. Dutton & Co.
Frederick Schwatka, *Children of the Cold.* Cassell Pub. Co.

Stage III. (Fourth and Fifth Grades)

Carpenter, *North America.* American Book Co.
Carpenter, *Asia.* American Book Co.
Tarr & McMurry, *North America.* Macmillan.
Frye, *Primary Geography.* Ginn & Co.
Redway & Hinman, *Natural Elementary Geography.* American Book Co.
World and Its People. Vol. III. Silver, Burdett & Co.
Frye, *Brooks and Brook Basins.* Ginn & Co.
King, *Picturesque Geographical Readers.* Second Book. Lee & Shepard.
Bayard Taylor, *Boys of Other Countries.* G. P. Putnam's Sons.
Mary M. Dodge, *Hans Brinker.* Charles Scribner's Sons.
Mary M. Dodge, *The Land of Pluck.* The Century Company.

Stages IV and V. (Sixth, Seventh and ~~Eighth~~ Eighth Grades)

Carpenter, *North America.* American Book Co.
Carpenter, *South America.* American Book Co.
Frye, *Complete Geography.* Ginn & Co.
Redway & Hinman, *Natural Advanced Geography.* American Book Co.
Tarr & McMurry, *North America.* Macmillan.
Dodge, *Reader in Physical Geography for Beginners.* Longmans.
World and Its People. Vol. IV. Silver, Burdett & Co.
Shaler, *Story of Our Continent.* Ginn & Co.
Herbertson, *Man and His Work.* A. and C. Black.
Lyde, *North America.* A. and C. Black.
Lyde, *Africa.* A. and C. Black.
Lyde, *Europe.* A. and C. Black.
Lyde, *Asia.* A. and C. Black.
Herbertson, *Illustrated School Geography.* Arnold.
King, *Picturesque Geographical Readers.* Third, Fourth and Fifth Books. Lee & Shepard.

High School.

Davis, *Physical Geography.* Ginn & Co.
Tarr, *Elementary Physical Geography.* The Macmillan Company.
Tarr, *First Book of Physical Geography.* The Macmillan Company.
Hinman, *Eclectic Physical Geography.* American Book Company.
Russell, *Rivers of North America.* Putnam.

Selected List for Teachers

General.

Longmans' Gazetteer. Longmans. The authoritative pronouncing and spelling gazetteer of the world.

Stieler's Hand Atlas. Perthes. The leading reference atlas.

Mill, *Hints to Teachers and Pupils on the Choice of Geographical Books for Reference and Reading.* Longmans. A valuable list of reference books selected by a leading authority.

Mill, *International Geography.* Appleton. The best single volume reference book on general and regional geography.

Stanford's Compendia. Reissue. Stanford. Volumes on Asia, Africa, Australasia, North America and Europe, written by experts. The leading recent reference books on the individual continents.

Bulletin of the American Bureau of Geography, Winona, Minn. (Periodical.)

Journal of School Geography, Lancaster, Pa. (Periodical.)

Methods.

Geikie, *The Teaching of Geography.* Macmillan. A very suggestive book on the essentials of good geography teaching.

McMurry, *Special Method in Geography.* Public School Publishing Co. Devoted to the Mississippi Valley, and emphasizes teaching by selected topics.

Physical Geography.

Mill, *Realm of Nature.* Scribner's. A very valuable and simple book on physical and mathematical geography and on biogeography.

Davis, *Physical Geography.* Ginn & Co. An authoritative secondary school text, particularly helpful in reference to the land features.

Davis, *Elementary Meteorology.* Ginn & Co. The leading English book on weather and climate.

Ward, *Practical Exercises in Elementary Meteorology.* Ginn & Co. Very helpful to teachers who have to deal with weather phenomena.

Davis, King & Collie, *The Use of Governmental Maps in Schools.* Henry Holt & Co.

Biogeography.

Keane, *Ethnology.* Cambridge University Press. One of the leading books on the races of men.

Ratzel, *History of Mankind.* (3 Vols.) Macmillan. A very comprehensive book on the races of mankind, the first volume being particularly valuable for its consideration of the problems of race distribution.

Wallace, *Island Life.* Macmillan. Classic book on animal distribution from geographic standpoint.

Guyot, *Earth and Man.* Scribner's. One of the older books, and hence not written from a modern standpoint; but still invaluable for presenting the relation of earth features to life.

(See also chapters in International Geography, noted above.)

— Teachers College Record

The Secondary Course in Physical Geography

Time, two periods of thirty-five minutes each; one period of eighty minutes.

The field to be covered in a course of physical geography in a secondary school is well blocked out by the better text books on the one hand, and the entrance examinations for certain universities on the other. The Earth as a Whole, the Atmosphere, the Land, and the Water, are the four divisions accepted for the work, as was clearly outlined by the Sub-Committee of the Committee on College Entrance Requirements of the National Educational Association.[1] Opinions differ, however, as to the order of treatment, as to the plan of treatment, i.e., amount of laboratory and field work, etc., as to the amount of time to be given to each topic, and concerning the year of the secondary school in which the work should be given. In the Horace Mann School the course is outlined to satisfy the requirements for entrance to Columbia College, and hence must be given in the later years of the course.[2] The course is given in two single thirty-five minute periods, and one double period of eighty minutes weekly. More than half of the time is devoted to laboratory and field work, and there is a certain amount of library work besides the study of the text. Davis's *Physical Geography* is used as a source of reference, but the text is used after the class presentation of the subject rather than before it.

[1] *Journal of School Geography*, September, 1898, pp. 248-262. *Proceedings National Educational Association*, 1898, pp. 973-984; 1899, pp. 780-794.

[2] Physical geography is made such a strong and necessary part of the elementary school geography work that an introductory course in the subject in the first or second year of the secondary school is unnecessary and would not be much in advance of the work of the grades.

The Aim of the Work

The best thought in reference to secondary work in physical geography, as expressed by the leading teachers and in the foremost texts in current use, is unanimous in agreeing that there should be no endeavor to present a complete course in any one of the several elementary subjects that contribute naturally to work in physical geography. Meteorology, Oceanography, Geomorphology, and Anthropogeography, as such, should be left for the colleges, or perhaps in some cases may be given as electives in the advanced years of the High School. In physical geography the aim should be to give the pupils training in scientific thinking and a knowledge of the relation and relative importance of the more important factors involved in considering causally the relation of the physical environment to man and life. The several topics would lose in value and in interest if the life side were omitted, and thus life effects should have an important amount of attention.

In the course in the Horace Mann School the life effects are brought in constantly as each topic is treated so that the pupils may see each topic in its practical significance. The effectiveness of this method of procedure is far superior to that when the topics are treated in a straight, scientific sequence, leaving the application to life to a few summary exercises at the end of the course. It should not be supposed, however, that such a treatment precludes the possibility of summarizing chapters in human geography at the close of the course. Indeed, such a summary is of great value in bringing together the many topics that may have been somewhat scattered in the progress of the work. If time allows, such exercises should be incorporated.

Finally it may be said that the course in the Horace Mann School is not a course in human geography from the physical side, but a logical, progressive, scientific course in physical geography, with a very strong life flavor thereto.

Plan of the Course

The order of topics outlined above, i.e., Earth as a Whole, Atmosphere, Land, and Water, is preferred for several reasons. The first two topics are necessary preliminaries to a causal and

scientific study of the land forms, and hence should precede the Land and Water. There is no especial reason from the standpoint of cause why the water should precede the land, and hence it is put last: that the land may be treated early so as to make the work practical and interesting; that it may be treated fully and without omission of serious points; and because the oceans are less important than the land from the standpoint of human relations to the earth.

In each division of the course as much is taught as is necessary for the causal understanding of facts that follow in later sections, and the work is accurate and scientific. No attempt is made, however, to make an exhaustive study of the elements of physical geography, a field of study much better reserved for the early college years.

The course which is outlined below has been the outgrowth of several years' experience and study, during which time the course has been given by three others besides the Professor of Geography. The suggestions for library work and certain details in reference to laboratory exercises are the work of Miss Harriet A. Luddington, Instructor in Geography in the Horace Mann High School in 1899–1900.

The Course in Outline

General Introduction. — Description of the science of geography, methods of work, etc.

The earth as a whole —

- Shape.
  - Evidence of globular form.
  - Consequences of living on an earth of this shape.
- Size.
  - Measurement of the earth.
  - Relation of human life to size of earth.
- Motions.
  - Rotation.
    - Character of the movement.
    - Consequences of rotation — defining direction, determining relative position, measurement of time, day and night, flattening at poles. Life effects due to rotation.
    - Determination of latitude and longitude (briefly).
    - Use of latitude and longitude in navigation and land surveying.
  - Revolution.
    - Rate, path, and direction of revolution.

Most important effects of revolution.
Magnetism.
Compass, poles, variation, and lines of no variation.
Laboratory work.
Plotting diagrams to show,
Path of earth about sun and position at different seasons.
Inclination of axis and distribution of light at different seasons.
Direction of magnetic meridian.
Direction of true meridian, — the magnetic variation for the locality being given.
Special topics (for individual work).
What is a solar day, sidereal day, civil day?
What is mean time, standard time?
Find the origin and location of standard time belts.
What is the International Date Line? Locate.
What is a natural magnet? What is the lodestone?
Trace the history of the mariner's compass.
Compare the line of no magnetic variation with the earth's meridians.
Library work.
Size of earth — Davis, *Physical Geography*, pp. 12, 13–15.
Rotation of the earth — Davis, *Physical Geography*, pp. 15–17.
Foucault's pendulum — Thornton, *Physiography*, p. 246; Jackson, *Astronomical Geography*, p. 70; Goode, *Journal of School Geography*, October, 1899, pp. 298–302.
Latitude and longitude — Davis, *Physical Geography*, pp. 388–393.
Revolution.
Who were Copernicus, Galileo, Kepler, and Newton?
What were their theories and discoveries?
How received?
(See encyclopedias).
References.
Davis, *Physical Geography*, pp. 10–17.
Tarr, *First Book of Physical Geography*, pp. 3–7, 13–15.
Hinman, *Eclectic Physical Geography*, pp. 28–32, 43–54.

The Atmosphere

Introductory.
Composition — Offices of the atmosphere.
Brief explanation of instruments used for observation of atmospheric changes.
Thermometers —
Difference between
Fahrenheit, Centigrade, Réaumur.
Maximum and minimum.

Barometers —
Mercurial, aneroid.
Method of taking observations.
Method of recording.
Thermographs, barographs.

(Start records to run over one month, and to include observations of temperature, pressure, direction of wind, condition of sky, twice daily. Keep on blank forms furnished,[1] and at the end of the month compare the records with those given on the weather maps.

Take all records at certain definite times during the day, preferably at 8:30–9, 1–2.

Compare the readings taken from the mercurial barometer with records made by the barograph for same time.)

Temperature.
Introduction.
Source of heat.
Nature of heat — review of physical terms and principles, i.e., reflection, transmission, absorption, radiation, etc.
The relation of earth to sun, and the earth's position in space.
Character of seasonal and diurnal temperature depending on relation of earth to sun.
Relation of life to seasonal and diurnal temperatures.
Expression of temperature conditions by isotherms.

Laboratory work.
Construct a diagram according to directions given on pp. 400–402, Davis, *Physical Geography,* and, placing a small globe as there directed, answer the following questions:
Which hemisphere has the greater amount of sunshine at each season?

[1] Three blank forms of uniform size, each capable of receiving records for thirty-one days, are furnished students. The first form is a general weather blank, ruled into 32 horizontal spaces, and a sufficient number of vertical spaces for records to include three entries daily of following topics: Thermometer, barometer, wind (direction and general strength), character of day; the bottom space gives a place for averaging the records for a month. Forms two and three are ruled into 31 vertical spaces, and to tenths of an inch horizontally, each complete inch being marked by a darker line. The thermometric blank allows for a range of fifty degrees, and the barometric blank has the upper full inch marked 31 and the lower 28. By placing dots in the proper positions between the upright lines, the basis can be laid for rough barographic and thermographic curves for a month. Records for days when there are no school sessions are taken from the self-recording instruments.

How does the direction of the sun's rays vary at different seasons — in each zone?

How does the length of day vary at different seasons, in each zone?

Find at what time of year weak sunshine and short days prevail in any region; at what time strong sunshine and long days prevail.

How are the limits of zones determined?

What zones never have a vertical sun? What zones are never outside the limit of sunlight? Are there any regions that never have oblique rays?

What divisions of the year result from the succession of high and low temperatures? Are these divisions applicable all over the world? Reason for opinion.

Plot isotherms on blank United States weather map to represent the distribution of temperature in United States on a single day.[1]

Place by each station mentioned the temperature recorded for that place.

Connect by a curving line all places having a certain temperature, e.g., 40°. This is the isotherm of 40°. It divides the United States into two sections — one warmer than 40°, one colder.

Draw other isotherms for every even ten degrees, estimating the position of a line where the records are not given in even tens.

Make a summary of the facts of temperature distribution as shown by the isotherms drawn.

Color the portion of the map where the temperature is below 30° a dark blue. Color with red the portion where the temperature is above 40°.

Compare your map with the United States weather map for the same day; make any necessary corrections.

Study the United States maps for a week following the date of the one thus noted. Note the changes in temperature distribution.

Isothermal charts (to be studied in laboratory. Charts used those of Longmans' *New School Atlas*).

Study January and July isothermal charts of the world.

Contrast northern and southern hemispheres as to evenness of isotherms.

Find the hottest spot and coldest spot on each map. Where is the "cold pole" on the January map? What is the average temperature?

In what regions are the isotherms crowded together? In what regions are they wide apart? Meaning of such ar-

[1] The blank weather maps used are secured from the United States Weather Bureau. See p. 51.

rangements. Relation of these areas to distribution of leading nations.

In what regions are the isotherms most regular, nearest to direction of parallels? In what regions are they most irregular, and in what direction? Meaning of each arrangement.

How do oceanic and continental areas compare as to temperature in winter and summer?

Find the place and range of the heat equator. On blank outline maps of the world plot its January, July, and average position.

Follow the isotherms passing through New York (January, July), and note the regions through which they pass. What great cities near them?

Summary of facts to be made in class according to the following heads:

Relation of parallels of latitude and isotherms in northern and southern hemispheres.

Comparison of isotherms over land masses and water. For January; for July.

Comparison of east and west side of continental masses. Make comparison along the parallel of 40° N. Lat. and S. Lat.

Comparison of isotherms of northern and southern hemispheres in January and July.

Migration of temperature belts, and relation to earth's position in reference to sun.

References.

Davis, *Physical Geography,* pp. 22–29.

Tarr, *Elementary Physical Geography,* pp. 43–67; *First Book of Physical Geography,* pp. 55–84.

Hinman, *Eclectic Physical Geography,* pp. 58–64.

Ward, *Practical Exercises in Elementary Meteorology,* pp. 51–61.

Mill, *The Realm of Nature,* pp. 129–133.

Atmospheric pressure.

Introductory. — Measurement.

Method employed — barometric readings — when taken — reduction to sea level.

Determination of altitude by means of barometric pressure.

Computation of height of atmosphere.

Relation of temperature to pressure.

Expression of pressures by isobaric lines.

Laboratory study of isobaric surfaces and lines.

Variation of atmospheric pressure from the normal isobaric pressure of 30 inches at sea level.

Taking a horizontal line as *sea level,* at which all barometric readings are taken, plot the warping of the 30 inches isobar from some low to some high pressure area. Select some weather maps with a good low and high pressure area, and take some readings of each isobar between the two centres.

Take 5 mm. for every .1 inch above.
Take 1 mm. for every .1 inch below.

Plot by lines the distribution of pressure in the United States for days whose temperatures have previously been studied. Use blank United States weather maps.

Place by each station mentioned the barometer readings for that place.

Draw a line connecting all places having the same barometric conditions, e.g., a pressure of 29.90 inches. This is the isobar of 29.90.

Draw isobars for every even one-tenth inch, estimating the position of a line where the readings are not in even one-tenth inches.

State the facts of distribution of pressure as shown by the arrangement of isobars.

Describe the difference in arrangement of isobars and isotherms.

Find the regions of lowest and highest barometer. Mark these areas "low" and "high," respectively.

Color brown all regions where the pressure is below 29.90: color red all parts having a pressure above 30.00.

Compare your map with the United States map for the same day; make any necessary corrections.

Study a series of maps covering a week's record. Note the changes in pressure distribution. What becomes of the "highs" and "lows"? Do they take any one general direction across the country?

General distribution of pressure over the earth. Study the January and July isobaric charts of the world.

Examine each chart separately, then compare the January and July charts with one another.

Find the regions of highest and lowest barometric pressure, and note their general location.

How do the areas of low and high pressures compare with the temperature belts previously studied? Do the facts agree with the prophecies made during that study?

Summary of facts to be made in class, according to the following heads:

Warping of isobars.

Change from summer to winter, over land and over water.

Comparison in relative amount of warping in northern and southern hemisphere.

Location of areas of maximum and minimum pressure.
For summer; for winter.
Migration of belts of maximum and minimum barometric pressure.
Relation of isobars to isotherms.
References.
Tarr, *First Book of Physical Geography*, pp. 85–90.
Hinman, *Eclectic Physical Geography*, pp. 78–81.
Ward, *Practical Exercises in Elementary Meteorology*, pp. 76–85.
Mill, *The Realm of Nature*, pp. 134–135.

Circulation of the atmosphere.
Introduction.
Winds. — What are the winds? — Direction of motion.
Method of observation, measurement of velocity, classification according to velocity, etc.
Winds consequent upon a rotating planet (planetary).
Trades; prevailing westerlies; doldrums; horse latitudes; upper currents.
Location and characteristics of each belt; seasons and character of life in each area.
Relation of wind belts to isobars and isotherms.
Winds consequent upon a planet inclined 23½° in its axis (terrestrial).
Seasonal changes. Shifting of calm belts — consequent disturbance of path of winds — effect of earth rotation.
Winds consequent upon distribution of land and water (continental).
Continental winds. Importance in New York City.
Monsoons.
Winds consequent upon diurnal conditions.
Mountain and valley breezes.
Land and sea breezes.
References.
Davis, *Physical Geography*, pp. 29–45.
Tarr, *Elementary Physical Geography*, pp. 68–84; *First Book of Physical Geography*, pp. 90–102.
Hinman, *Eclectic Physical Geography*, pp. 78–89.
Mill, *The Realm of Nature*, pp. 116–122.

Moisture in the atmosphere.
Source — evaporation.
Capacity of atmosphere for moisture. Dew point — relative degrees of saturation — cause of precipitation.
Transportation of moisture by prevailing winds.
Measurement of humidity.
Forms of moisture in atmosphere.

Dew.
Frost.
Hail.
Snow.
Clouds.
Forms and causes.
Causes of precipitation. Influence of highlands upon precipitation.
Relation of precipitation to storms.
Storms of the westerly wind areas.
Control of the weather by storms.
Characteristics as to temperature, pressure, cloudiness, rainfall.
Path and rate of progress.
Hot and cold waves, northers, blizzards, etc.

Laboratory work.
Study of winter storms of the United States, from selected series of United States weather maps.
Describe the distribution of winds about the centre of a cyclonic or low-pressure area. What is the general direction of winds about an anti-cyclonic or high-pressure area? Average direction of winds in each quadrant for a series of storms.
In what quadrant of the storm area do you find clouds and rain? Do you find snow in any part? Where is the clear weather?
Note the general direction of the isotherms in a low-pressure area. Explain the warping of these lines. How do the high-pressure areas differ in this respect?
Using the maps in the *Monthly Weather Review*, find the distance travelled by a storm, in miles per hour. Find the highest, lowest, and mean velocity.
References.
Davis, *Physical Geography*, pp. 48–50.
Tarr, *First Book of Physical Geography*, pp. 102–121; *Elementary Physical Geography*, pp. 93–104.
Hinman, *Eclectic Physical Geography*, pp. 90–97.
Ward, *Practical Exercises in Elementary Meteorology*, pp. 85–124.
J. M. Jameson, "Elementary Meteorology," *Journal of School Geography*, January, February, March, and April, 1898.

Rainfall.
Method of recording amount.
Study of distribution from rainfall chart for the world.
Relation between general system of winds and calm belts and rainfall.

Equatorial rains; influence of highlands, deserts.
Trade wind belts and trade wind deserts.
Horse latitude belts — little rain.
Westerlies; effect of barriers upon rainfall.
Study distribution of rainfall in United States, using rainfall model and rainfall charts for the following regions, stating maximum and minimum, and trying to give causes for variable amounts.
Atlantic coast.
Gulf coast.
Lake region.
Mississippi Valley.
Great Plains.
Rocky Mountains.
Great Basin.
Sierra Nevada and Coast Ranges — contrast north and south.
Relation of rainfall to interests of man.
Agriculture. (Discuss value of irrigation.)
Forestry.
Manufactures.
Commerce.
References.
Davis, *Physical Geography,* pp. 45–47.
Tarr, *First Book of Physical Geography,* pp. 144–148; *Elementary Physical Geography,* pp. 114–123.
Hinman, *Eclectic Physical Geography,* pp. 76–77.

Summary of weather and climate.
Weather.
Characteristic summer and winter weather of eastern United States.
Study weather signals employed by United States Government.
Climate.
Relation of weather to climate; most important climatic elements.
Climates of the different zones.
Subdivisions according to varying character of different portions — land and water, coasts and interiors, mountain and plateau.
Dominant climatic features of these subdivisions.
Seasonal conditions; effect upon life.
General relation of climate to vegetation, animals, man.
References.
Davis, *Physical Geography,* pp. 52–56.
Tarr, *First Book of Physical Geography,* pp. 149–164; *Elementary Physical Geography,* pp. 124–134.

Ward, "Climatic Notes Made During a Voyage Around South America," *Journal of School Geography*, September and October, 1898.

Equipment available for studying weather and climate.
Maps and atlases.
Daily United States weather maps.
Series of old weather maps selected and mounted on cards.
Monthly Weather Review maps.
Bartholomew's *Atlas of Meteorology*.
Wall maps, enlarged from small-scale atlas maps, showing,
Rainfall of world.
January isobars.
July isobars.
January isotherms.
July isotherms.
Mounted records of barograph and thermograph for a year.
Large series of diagrams copied from standard works on meteorology.
Models.
Howell's model, showing rainfall of United States.
Instruments.
Dry bulb Weather Bureau standard thermometer.
Wet bulb Weather Bureau standard thermometer.
Maximum Weather Bureau standard thermometer.
Minimum Weather Bureau standard thermometer.
Weather Bureau standard barometer.
Richard Frères barograph.
Richard Frères thermograph.

The Land

General features of the earth's surface.
Distribution of land and sea.
Determination of land and water hemispheres.
Contrasts in land and water areas in their effect upon life.
Extent, outlines, grouping of continental masses.
Representation of earth's features on flat surface.
Elements of map projection — stereographic, conic, and Mercator; projections compared; advantages and uses of each.
Representation or relief — hachures, shading, contour.
Laboratory work.
Study of simple topographic maps of the United States Geological Survey, e.g.:
Marthas Vineyard sheet (2 periods).
Find the latitude and longitude of the locality.
Note the location of railroads, roads, houses, town. Why located in these places?

Find the highest point, lowest area, gentlest slope. Find the difference in elevation of the two highest points and how far apart they are. Could one be seen from the other?

Find a hill, valley, promontory.

Determine the best bicycle road between two selected places, and determine the distance by road between them.

Work out the horizontal scale of the map. What is the length of the island?

Make a cross section from Oyster Pond across Indian Hill. What is the vertical exaggeration in your section? Use 1-10 inch to represent every 20 feet of elevation.

Characteristics of the land.
  Varieties of land surface.
  Climate and activities of the lands.
Relation of the physical conditions of the lands to life.
  Relation to distribution of animal and plant life.
  Influence upon human life.
    Contrasts in effect upon savage and civilized races.
The rocks of the earth's crust.
  Strong rocks, or ridge and highland makers.
  Weak rocks, or valley and lowland makers.
  The origin and position of rocks in earth's crust.
    Crystalline rocks, and their effects upon topography.
    Stratified rocks, and their effects upon topography, as determined by their relative strength.
Changes in original land forms.
  Erosive processes.
  Agents of erosion and transportation — mode of action; effect of character of rocks; vigor of force, etc.
  General result of erosive processes; life cycle, young, mature, and old land forms.
  Deposition of waste.
    Laws governing deposition.
    Some important results — formation of deltas, bars, continental shelf; construction of alluvial fans, alluvial plains; lake filling, valley filling.
  References.
    Davis, *Physical Geography*, pp. 99–100, 103–105, 267.
    Tarr, *Elementary Physical Geography*, pp. 205–207; *First Book of Physical Geography*, pp. 240–260.

Typical land forms.
  Plains.
    Young or constructive plains.
      Coastal plain.
        Origin and structure.
        Characteristics.

Form and surface; accordance of surface with structure; character of rocks and soils.
Character of shore line — at first; change by addition of sand reefs, etc.
Drainage and dissection.
Base level — control of drainage.
Relation of dissection to drainage.
Water supply — artesian wells; conditions necessary.
Fall line — how formed; location on Atlantic border; importance.
Influence upon life of man.
Location of villages, roads, etc.
Relation of back country to plain; commercial relations; harbor facilities.
Stages in development or "ages" of coastal plain.
The geographical cycle.
Youthful stage — characteristics; culture relations.
Mature stage — aspects; characteristics; relation to life.
Approach to old age. Compare with characteristics and culture relations of mature stage.
Old age. Contrast with youthful stage; points of similarity.
Classes of coastal plains.
Narrow and broad coastal plains.
Characteristics of each. Compare forms, surface, drainage, coast line, culture relations. Reasons for differences.
Embayed coastal plains.
Characteristics; previous condition; reasons for present aspect; relation to life of man.
Belted coastal plain.
Structure; characteristics.
Peculiarities of dissection, drainage, and distribution of uplands and lowlands.
Coastal plain of New Jersey (considered as a type).
Extent and relief; significance of slight relief.
Structure — surface — location of uplands and lowlands, direction of highest highland; soils — kinds and distribution.
Drainage — size, vigor, direction, work. Why are the valleys of the westward flowing "creeks" deeper than the seaward flowing "rivers"?
Coast line — characteristics; lagoons, "thorofares," beaches.
Relation to man's life — location of industries, commercial centres, railroad routes, etc.
Reasons for conditions.

Maps and models to illustrate topics under coastal plains.
Models.
Mountains bordering the sea. Harvard models. W. M. Davis and G. C. Curtis.
Narrow coastal plain. Harvard models. W. M. Davis and G. C. Curtis.
Geological model of State of New Jersey. New Jersey Geological Survey.
Maps.
Topographic atlas of United States. Folio I, Physiographic Types, Plates I–III.
Grouped contour map sheets:
Ocala and vicinity, Fla. United States Geological Survey.
Southeastern New Jersey. United States Geological Survey.
Maryland, Chesapeake Bay region. United States Geological Survey.
Glassboro, N. J. United States Geological Survey.
Maps and illustrations. Reports of New Jersey Geological Survey, 1895–1898.

Laboratory work under general study of coastal plains.
Notes on method of studying a map.
Notice:
Scale; contour interval.
Character of surface — contour lines near together or widely separated; general elevation of region.
Relief — small or great; localized or not.
Dissection — much or little.
Drainage.
General development — presence or absence of lakes, etc.
Direction, arrangement, activity of streams (the latter seen by relation to master stream.)
Culture features.
Roads — direction, relation to topography.
Railroads — course, grade, costly to construct or not.
Place of houses — relation to drainage and relief.
Towns — number, size, probable reason for location.
Detailed examination of special features illustrated by map and designated for study.
Grouped contour map sheets. — Ocala and vicinity, Florida.
Note general relief; character of surface. Does this region differ as to form from other regions studied?
Note whether or not the drainage is definite. How account for facts? Give reason for opinion.
Study areas of depression located 100 or more feet above sea-level. Account for them, if possible.
What is true concerning location and direction of roads, rail-

roads, and towns? What inferences may be drawn from these facts?

Contour map. — Glassboro, N. J. (An example of a coastal plain, partially dissected.)

What is the greatest altitude found in the northern part? In the southern part? Where found?

Compare the altitude and relief.

Describe the topography of the country represented in Sections 5 and 9.

Account for the course of Raccoon Creek; of Maurice River; of the tributaries of these streams.

Using the 100-foot contour line as a boundary, note and describe the valley of Raccoon Creek; of Maurice River.

Find the amount and grade of descent of each of these streams. Can you account for the difference?

Make two cross sections of the map — one cutting through the deepest part of Maurice River valley, the other cutting through the deepest part of Raccoon Creek valley.

Note and explain the course of roads and railroads, the scarcity of towns, the apparent insignificance and the distribution of the few found.

Describe the path of and the view to be seen from the Western Jersey Railroad, from Franklin to junction southwest of Newfield; from the Philadelphia & Reading Railroad from Five Points to Mullien Hill. What high points would you see, and how would the country look?

Laboratory work on classes of coastal plains.

Embayed coastal plain. (Grouped sheets of Chesapeake Bay region, Maryland.)

Study relief, drainage, dissection.

How do you account for the irregular shore line? Note particularly the region of Nominee Cliffs.

Reconstruct the history of this section of country.

Compare statements on p. 131 of text book (Davis, *Physical Geography*) with facts of the map. In what ways is geographic control strongly shown in this region?

Belted coastal plain. (Grouped sheets of southeastern New Jersey region.) Relief maps in *Report of New Jersey Geological Survey*, 1895; relief model of State of New Jersey (geological).

Compare with Florida map in general relief and character of surface; definiteness of drainage; control of location and direction of roads and railroads; position of towns. Reason for opinions.

Note what areas would remain above sea-level if New Jersey should sink 50 feet; 100 feet.

Note the names given to streams on the western side of the

plain; on the eastern. What difference in size, vigor, direction?

What does the straight line of land back of the lagoon and marsh area indicate? Reasons for answer.

What names are given to the waterways among the marshes bordering the lagoons? Why so named?

How does the route of the Camden, Atlantic & Philadelphia Railroad differ from that of other railroads? Reasons for this route.

Special topics. — Illustrative work in connection with study of general characteristics of coastal plains.

Make a diagram showing the conditions present in a region where a "fall line" exists. Number important points, and explain their relation to one another. Davis, *Physical Geography*, p. 128.

Show by diagram the structure suitable for the construction of "artesian wells." Explain why such wells may be made on off-shore sand reefs; on ancient coastal plains. Davis, *Physical Geography*, p. 127.

Individual work in connection with study of broad and narrow coastal plains.

Compare narrow and broad coastal plains in general characteristics and in culture features.

Draw a rough sketch map of that portion of the coastal plain of the Carolinas shown on p. 24 of Davis's *Physical Geography*. Using a suitable scale of miles, from information given in the text, indicate belts, elevation of inner margin of each, kinds of soil, productions. Locate on this map cities situated on the "fall line."

References for reading upon which special reports were made:

"Characteristics of Coastal Plain of South Carolina." Glenn, South Carolina, *Journal of School Geography*, January and February, 1898.

"General Features of Coastal Plain of North Carolina." Cobb, North Carolina, *Journal of School Geography*, November and December, 1897.

The New Jersey coastal plain given as a problem to be worked out individually. (Preceding study of coastal plain of New Jersey.)

From study of model and text, find what features are like plains already studied; what features different from those previously considered.

What peculiar and (so far) unusual drainage conditions are found? What explanations may be suggested? (Recall Raccoon Creek and Maurice River on Glassboro map).

Under what class given in the text book should this plain be placed?

Why?
References for study of New Jersey coastal plain.
Davis, *Physical Geography*, pp. 113–116.
Salisbury, *Reports of Geological Survey of New Jersey*, 1895, pp. 57–64; 1898, p. 185, etc.

Alluvial or flood plains and lake plains.
Flood plains — mode of formation; characteristics; relation to life of man. Comparison with coastal plains.
Lake plains — formation — filling up, swamping, draining; characteristics; culture relations. Comparison with flood plains and coastal plains.
Reference.
Davis, *Physical Geography*, pp. 278–288, 340.
Maps used to illustrate topics and for laboratory work under flood plains and lake plains.
Contour map — Fargo — James River region, North Dakota. United States Geological Survey.
Grouped sheets — Donaldsonville and vicinity, Mississippi River delta. United States Geological Survey.
Large map of alluvial plain of Mississippi River from mouth of Ohio to Gulf. Mississippi River Commission.
Old plains of erosion.
Terms — peneplain, monadnocks.
Contrasts with constructive (young) plains.
Characteristics; effect of uplift. How old plains differ.
Drainage — comparison with that of young plains.
Culture relations; effect of change of base level.
Reference.
Davis, *Physical Geography*, pp. 189–195, 152–155.
Plateaus.
Young plateaus (Arizona as an example).
Structure; character of surface. Compare with plains.
Dissection and drainage.
Characteristics; arrangement of drainage lines.
Evidence and results of erosion — canyon walls, cliffs, and talus slopes; falls and their extinction.
Effect of climate.
Relation of man to young plateaus —effect of aridity; habitability of region; barrier to travel.
Illustrative material.
Pictures and maps in Dutton's *Tertiary History of the Colorado Cañon.*
References.
Davis, *Physical Geography*, pp. 141–146.
Gannett, *North America.* "Description of Colorado Cañon."
Russell, *Rivers of North America*, pp. 271–275.
Individual work.

Make a diagram showing the process of retreat and extinction of falls in a canyon. Number important points and explain their relation to one another.

Reference.

Davis, *Physical Geography,* p. 144.

Dissected plateaus. (Type — Cumberland, Allegheny, Catskill plateaus.)

Characteristic features.

Dissection and drainage.

Remnant "mountains." — How formed.

Culture relations — man's life and industries. Why are coal and iron mines in the valleys instead of on the uplands?

Illustrative material.

Map and model of Catskill and Chattanooga region. Sewanee and Buckhannon Folios. United States Geological Survey.

References.

Davis, *Physical Geography,* pp. 146–150.

Ellen C. Semple, "Influence of the Appalachian Barrier upon Colonial History," *Journal of School Geography,* February, 1897.

Old plateaus. (New Mexico as an example.)

Peculiarities of surface; character of drainage.

Mesas and buttes — how formed; relation to former height of plateau.

Relation of old plains to old plateaus.

Relation to man's life; old civilizations of mesas of North America.

References.

Davis, *Physical Geography,* pp. 150–152.

Hodge, "The Enchanted Mesa," *Nat. Geog. Mag.,* Vol. VIII, p. 273.

Broken plateaus. (Colorado plateaus as a type.)

Character of surface; relation of blocks; evidence of original continuity of surface.

Fracturing and faulting; fault cliffs.

Drainage and dissection.

Relation to life of man.

Reference.

Davis, *Physical Geography,* pp. 155–158.

Special topics.

In what way are young and dissected plateaus alike? How are they unlike?

Contrast the life features in each. What are the peculiarities of the inhabitants of each?

Describe the chief characteristics of the Catskill, Allegheny and Cumberland plateaus.

Give the origin of the uplands on an old plateau.

Laboratory work in connection with study of plateaus.
- Colorado Canyon map, composed of mounted topographic sheets of the United States Geological Survey.
  - What is the general character of the streams of this region as to arrangement and relation to relief?
  - Note the contour lines. What indication do they give that this is a plateau region?
  - Notice the shape and position of mesas and buttes. What story do they tell concerning events in this region?
  - What indications of man's presence in this desert country? Account for the location of such features.
- Catskill model and map.
  - Under what land form would you classify the Catskill Mountain region? Reasons.
  - Contrast the quality of slope and character of drainage of the upland surface with that of the escarpment.
  - What unusual features of drainage do you discover? Study drainage between Catskill Mountains and Hudson River. Note particularly the region about head waters of the Plaaterskill and Kaaterskill. Can you trace the history of these streams?
  - Note roads and railroads and account for their position. Explain the position of the road from Woodstock to Platt Cove.
  - Study the culture features represented in Kaaterskill Cove. What evidence of geographic control?
- Virginia and West Virginia map.
  - Study amount and character of upland surface; character and position of divides and streams.
  - How do the facts shown on map compare with the statements in Davis, *Physical Geography*, pp. 147–149?

Mountains.
- Block mountains.
  - Young stage. (Southern Oregon as a type.)
    - Character of ridges; evidence of change from plains to mountains.
    - Drainage and dissection — character and direction of streams; contrasts in dissection of different portions; effect of climate; formation of alluvial cones and talus slopes.
    - Earthquakes and hot springs — significance.
    - Relation to life of man.
  - Dissected block mountains. (Utah and Nevada as types.)
    - Characteristics — compare ridges with those of young "block mountains."
    - Effects of dissection — change of form; accumulation of detritus in troughs, on mountain flanks.

Climatic features — contrasts between mountain tops and valleys; aridity shown by streams.
Effect of geographic features upon life of man.

Laboratory work in connection with study of block mountains.
Grouped sheets — Great Salt Lake region.
Note the relief and the arrangement of contour lines. What points would suggest "block mountains"? In what stage of development?
Examine carefully Sevier Desert, Rush Valley, Skull Valley, Round Valley. Give conclusions as to aridity of regions.
How do roads, railroads, and settlements show geographic control?
Grouped sheets — Lake Tahoe region. (Example of dissected block mountains — desert conditions.)
Study the contour lines of valleys and adjoining mountains. Account for differences.
How does the direction of drainage in valleys differ from that in the mountains near? Explain. What peculiarity of many of the streams? Reason. What evidence that water of the region evaporates, leaving saline deposits?
Account for the position of roads and settlements.

Folded mountains. (Jura Mountains as a type.)
General form. Terms — anticline, syncline, trend, dip, strike, escarpment.
Structure — evidence of origin.
Drainage; direction; effects — process by which crests of folds are worn down and streams captured and beheaded. Formation of synclinal mountains and anticlinal valleys.
Relation to man — place of settlements, roads and farms.
Domed mountains. (Black Hills as an example.)
Form and structure.
Dissection and drainage — relation of drainage lines to original slope of surface; relation of rimming ridges to central mass.
Culture relations — mineral resources; industries.

Laboratory work in connection with folded and domed mountains.
Model and map of Chattanooga region.
How would you classify Sequatchie Valley? Reason for decision.
Classify Walden Ridge, Sand Mountain, and similar elevations. Why thus classify them?
Can you discover any reason for the location of Chattanooga?
Map of region of Henry Mountains.
Note the direction of contours and of drainage lines. Com-

pare with those on maps of Great Salt Lake region and Lake Tahoe region. Conclusions.

What suggestion does the map give you that this is a region not attractive for settlement?

Massive or lofty mountains.

Complexity of structure.

Drainage and dissection — resulting forms — peaks, ridges, valleys.

Mountain phenomena — earthquakes, avalanches, glaciers.

Embayed mountains.

Characteristics; compare with embayed coastal plain.

Relation to man's life. Why should such a region be less habitable than in its former condition?

Geographical relations of mountains.

Climate of mountains.

Mountains as barriers.

Character of inhabitants of mountains.

References.

"Development of a Mountain System." Tarr, *First Book of Physical Geography*, p. 337.

Davis, *Physical Geography*, pp. 167–171, 172–175, 179–180, 195–196, 175–179, 183–184.

Special topics (for individual work).

Products of worn down mountains. Reference, Davis, *Physical Geography.*

Mountain inhabitants; "stranded" races — their customs and languages. References, Davis, *Physical Geography;* Taylor, *Words and Places.*

The Piedmont belt south of New England. Reference, Davis, *Physical Geography.*

The New England upland. References, Davis, *Physical Geography; National Geog. Monographs — Physical Geography of Southern New England.*

The Scottish Highlands and their inhabitants. Reference, Davis, *Physical Geography.*

The Baraboo ridge, Wisconsin. Reference, Davis, *Physical Geography.*

Field work. Morningside Heights, 120th St. to 123rd St.

Nature of rock.

Dip and trend. What culture feature seems to be largely traceable to these two things?

Erosion. What agents seem to be most active? Give proofs.

Signs of glacial action. Make a list of all that you find. Conclusions.

Topography of upper New York as seen from the Heights. Describe briefly. What problems are presented by the presence of the historical "Hollow Way" — the lowland in which the Fort Lee Ferry landing lies?

Study the general geographic relations of this part of New York and name the features which seem to you the most important or controlling features of the region.

Volcanoes.
- Distribution.
  - Significance of location.
- Young volcanoes.
  - Form and structure of volcanic cones.
  - Phenomena of eruption; effects.
  - Lava flows; nature and effects.
  - Formation of calderas.
- Dissected volcanoes.
  - Characteristics.
  - Drainage; arrangement and character of streams.
  - Dissected lava plateaus.
- Worn down volcanoes.
  - Volcanic necks and dikes.
  - Lava "table mountains" or mesas.
  - Culture relations.

Study of contour map. Mount Shasta sheet. (Laboratory work in connection with general study of volcanoes.)
- What features shown on the map would indicate that Mount Shasta is a volcano?
- Describe the drainage of the cone.
- What are the sources of Whitney, Bulam, and Mud Creeks? Where else do you find something similar?
- In how many places can you find evidence of falls? What is the probable cause?
- What is the character of the country where the greatest number of intermittent streams are found?
- What is the probable origin of the Shasta valley?
- What is the cause of disappearance of streams at the base of the cone?
- Is there evidence of streams originating at base of cone? Reason. (Note Big Springs.)
- What is the probable origin of the swamps and lakes in this region?
- Make a cross section of Mount Shasta, from intersection of 5000-foot line with eastern border of map to a point on the 4000-foot line, exactly east of Boles Creek, horizontal scale as on map; vertical 1-10 inch to 2000 feet.

Certain great agents of topographic modification.
- Rivers.
  - Ground water.
    - Source.
    - Movement of water underground.
      - Important effects; caves, springs, geysers.

Life history of rivers.
- Young rivers.
  - Characteristics; activities.
  - Lakes; how formed; effects.
  - Falls and rapids; cause, effect on development of stream valley.
  - Relation of man to young rivers.
- Mature rivers.
  - Process of development.
  - Grading of course.
  - Development of meanders, broad valleys, and flood plains.
- Old rivers.
  - Necessary conditions; characteristics.
  - Why is it unusual to find an *old* river system?
- Revived rivers.
  - Cause of revival.
  - Important effects — narrow gorges in valley floors.
  - Relation to life of man.
- Dismembered rivers and drowned valleys.
  - Contrast conditions of formation.
  - Compare results — on land forms; use to man. Why should dismembered rivers form good harbors?
  - Noted examples.
- References.
  - Davis, *Physical Geography,* pp. 222–262.
  - Tarr, *First Book of Physical Geography,* pp. 261–293; *Elementary Physical Geography,* pp. 262–289.

Glaciers.
- Existing ice sheets and glaciers.
  - Continental, valley, piedmont glaciers. Locate examples.
  - Formation of glaciers — conditions necessary; structure of different parts; cause of variation in length of glacier.
  - Formation of ice falls and crevasses — relation to character of bed; compare with stream action.
  - Mode of erosion and transportation and deposition of waste.
    - What are the sources of the transported material?
    - Where and how transported? How does the glacier wear its bed?
    - Compare with erosion and transportation by river.
    - Moraines — lateral, medial, ground, terminal.
      - Formation and characteristics of each.
    - Features of drumlins, eskers, kames.
- Ancient glaciers and ice sheets.
  - Glacial period — meaning of the term.
  - Effects of glacial period.
    - Formation of valley flood plains. Explain diagram on p. 333, Davis, *Physical Geography.*

Formation of lakes in river valleys.
Terminal moraine; effect on landscape.
Ground moraine — character of material; usefulness of this soil.
Diverted rivers; rapids and waterfalls; divides formed by glacial material.
Why are most of these effects of great importance to man?
Contrast of central glaciated area of America with regions south.

References.
Davis, *Physical Geography*, pp. 324–346.
Tarr, *First Book of Physical Geography*, pp. 294–312; *Elementary Physical Geography*, pp. 306–327.

Laboratory work. Study of Heim's model of a glacier.
Note the location of tributary glaciers and study their relation to the main glacier.
Account for the different ways in which the small ice streams at right and left of main tributaries enter the main body of the glacier.
Study the arrangement of moraines. Account for their grouping just above the longest ice fall. Can you find any traces of a terminal moraine? If so, note its position and extent.
Study crevasses and seracs and account for their position.
Note the extent of separate glaciers. Why does the main one reach farther down the valley than the others?

Study of maps of glaciated region.
Maps: grouped sheets — Sun Prairie, Wis.; Central Massachusetts, Boston Harbor.
Study the effect of glaciation upon drainage. Can you find any streams whose courses have been diverted? Where?
Note the number and distribution of small lakes. Can you suggest their origin? What is the cause of the various swamps near the lakes, or existing independently?
What would you suggest as a cause for the numerous islands of similar shape in Boston Harbor? Why are some of them apparently wasting rapidly?

Field work. Staten Island, South Beach.
Study on the beach the examples in miniature of an initial stage of a coastal plain.
Notice the action of wind upon the sand above high tide line. If the forms thus made could be covered and preserved, what facts could be read from them in future time?
Study the lagoon formation and note how the land area has been extended and is increasing.
Walk from beach to moraine.
Note the changes in character of deposits as you move inland. Explain.

Make a note of the features that you consider most distinctively morainic and give reasons for your choice.
What evidence that this is the work of ice — of a glacier?
What agents other than glacial have been at work here? What have they done?
What facts go to show that the glacier was moving in a general southerly direction? (Use observations made on the way from the beach to the moraine).
What have been the effects of this glacial deposit upon the life of the vicinity?
Can you discover any reason for the location of the small factory seen in the distance?

Bronx Park.

Compare the two portions of the stream valley (valley of the Bronx River) and account for their present aspect.
Where is erosion most active? Where is deposition in rapid progress?
What problems are presented by the presence of the large pot holes found in the rocks far above and at a distance from the stream? Give your own explanation.
If the dam near the old mill should be removed, what would be the effect upon the stream and its surroundings?
Is there any evidence of glacial action to be found in this region? Compare with evidences found elsewhere.
How is geographic control shown in the culture features of this vicinity?

The Oceans

Erosive work of the ocean.

Read the statements on pp. 347–348, Davis, *Physical Geography,* concerning the interaction of destructive forces at work upon land forms. Why does not the land area become greatly reduced?

Shore lines.

Meaning of terms shore line and coast?
Upon what does original outline of coast land depend?
Classification of shore lines.
Number of classes — how produced; characteristics.
Elevated shore lines; shore lines of the first class.
Characteristics.
Changes effected by the ocean.
Sand reefs — formation; advance and retreat.
Inlets — relation to coastwise traffic; tidal deltas.
Effects of depression and elevation upon this class of shore lines.
Characteristics of new shore line in each case.
Effect upon life of man.

Depressed or drowned shore lines — shore lines of the second class.
General characteristics; relation to man's life.
Changes effected by the ocean.
Formation of sea cliffs and benches; sea caves.
Formation of bay head beaches and retreat of sea cliffs; formation of barrier beaches and general retreat of shore line — effect of strong tides.
Land tied islands — process; importance to man.
Effect of elevation and depression upon drowned shore lines.
Characteristics of new shore lines; culture relations.

Questions for review.
What features would you expect to find on a shore line of elevation? Name some changes that lapse of time brings about. Of what use to man are these forms?
How would you know a depressed shore line? What changes does time make upon it? What relation have these forms to man's life?
Describe the formation of bay head beaches and barrier beaches.

Laboratory work. Study of Heim's model of shore features.
Study the contrasts of shore topography. Note the points of attack and of deposition, and study the results of each kind of work.
Compare the various beaches and explain their origin.
Can you find any evidence of uplift? Study the relation of outstanding islands to the shore. What facts in their history are suggested?
Compare the past and probable future history of the lagoon between the two bold headlands at the left of the model with that of the lagoons back of the sand dunes at the right of the model.
How is geographic control over man's life shown on this model?
Grouped contour sheets — New Jersey and Massachusetts coast.
Massachusetts coast — Provincetown peninsula.
Study the region from Highland Light northward. Where can you find evidence of attack by the sea? Of deposition? Contrast the outside and inside coasts of the peninsula.
Note the hooks and spits along the ocean side of the peninsula. From whence is the material for their formation derived?
In what localities do you find cliffs? Where are they protected? Where now being cut? Why should the long straight eastern shore be called the "graveyard of the Cape"?

What do the roads and railroads suggest concerning the character of the country?

New Jersey coast.

Note the relation of Sandy Hook to the mainland. Compare the inner and outer shores and account for conditions found. Compare with Provincetown peninsula.

Study carefully the cliffs, spits, hooks, sand bars, lagoons, and "thorofares." What formations are dependent one upon another, and how? Compare with Massachusetts coast.

Where on the coast do you find protected cliffs? Where are cliffs or beaches being attacked by the sea? What conditions are like those shown on Provincetown map?

Is there any evidence that this region has been recently elevated? If so, where? What are the evidences of depression?

How do the culture features show geographic control?

References.

Davis, *Physical Geography*, pp. 347–383.

Tarr, *First Book of Physical Geography*, pp. 313–331; *Elementary Physical Geography*, pp. 328–349.

Form, divisions, and general characteristics of the ocean.

Essential continuity and uniformity.

Depth, composition and density, temperature.

Where are the greatest depths found?

What reasons are there for the nearly uniform density of the ocean throughout its entire depth?

Account for the great variety of substances found in ocean waters.

What reasons may be given for the low temperatures of the ocean depths? For the small range of temperature at the surface?

What proofs may be given of interchange between polar and equatorial waters?

Divisions of oceanic area.

Great oceans; depth and volume compared with extent and elevation of land surface.

Mediterranean — relation of important ones to continental masses; significance of temperature peculiarities.

Submerged continental shelves — relation to continental masses.

The ocean floor.

General character. Compare with land surface.

Sediments — origin and characteristics.

Character and distribution of life in the ocean.

What are the characteristics of life in the surface layers? In the deep sea?

What comparisons may be made between life in the ocean and upon land?

Movement of ocean waters.
- Waves.
  - Cause; characteristics of wave movement. What proof may be given that the wave form and not the water moves onward? Explain the use of oil to reduce the violence of storm waves.
  - " Swell " and " surf ": causes; effects.
  - Earthquake waves.
    - What cause, other than volcanic eruptions, sometimes produces these waves?
    - Describe and account for their very destructive effects.
- Currents.
  - Causes; proofs of control by prevailing winds; direction and rate of movement; " drifts " and " streams." Why is a knowledge of the movements of currents important in navigation? What interesting indications of the movements of currents have been noted? (See Davis, *Physical Geography*, p. 79).
  - Important currents; oceanic eddies; branch currents or " streams "; relation of currents of Indian Ocean to monsoons. (Read pp. 42, 43, 80, Davis, *Physical Geography.*)
  - Influence of oceanic currents upon temperature — temperature of the Atlantic; effect upon life of man.
- Tides.
  - Characteristics of tidal movements.
    - Flood and ebb tides; effect of land; range of tide in bays.
    - In what ways do tides resemble waves?
  - Cause of the tides.
    - What reasons for connecting tidal movements with the moon?
    - Study the " tidal problem," pp. 406–407, Davis, *Physical Geography.*
  - Importance of tides.
    - Why beneficial in bays and harbors?
  - Peculiar tidal phenomena.
    - Bores; tidal races.
    - Spring and neap tides.

Questions for review.
- What are the tides? How often do they occur? Describe the phenomena briefly.
- Contrast the conditions as to tidal waves in open ocean and in bays.
- Compare tides and waves.

References.
- Davis, *Physical Geography*, pp. 57–90.
- Tarr, *Elementary Physical Geography*, pp. 151–203; *First Book of Physical Geography*, pp. 187–219.

The Earth and Man. (A Summary and Review.)

Civilization as related to environment.
- Barbaric races. Control exercised by environment strong.
- Civilized peoples.
  - Control of the past.
  - Control of the present — less marked. Ability to overcome existing conditions.
  - Travelling across the continent to-day compared with difficulties encountered half a century ago.

Relation of surface features to man.
- Mountains — barriers due to trend, steep slopes, lack of water, rarity of air.
  - Effect of barriers upon the settlement of a country, e.g., influence of the Appalachian barrier upon the settlement of the United States.
    - Determined lines of settlement.
    - Directed and limited immigration and migration.
    - Strengthened early settlements.
    - Offered protection from enemies.
  - Dangers arising from a sharp line of demarcation between a people.
    - Relation of pioneer settlements of Mississippi valley to Atlantic States.
  - Effect of barriers upon the development of a region.
    - Growth checked through limitation of boundaries. Newburg and Fishkill compared.
  - Effect of mountains upon life of people.
    - Characteristics of mountain dwellers — Scotch, Swiss, etc.
    - Differences in a people arising from separation of valleys — e.g., clans of Scotland.
    - Slow development of isolated mountain dwellers. Mode of life of the natives of the mountains of Tennessee and Kentucky. Industries of the home — method of trade, etc.
    - Influence of mountains upon industry.
- Valleys.
  - Gateways for exploration.
  - Regions of early settlement. Compare the settlement of the Mohawk and the Hudson valleys with that of adjacent mountains and plateaus.
  - Importance commercially — e.g., Hudson and Mohawk valley a great factor in determining the supremacy of New York City.
  - Highways of travel.
- Plains.
  - Seat of early civilizations, e.g., Chinese — developed in river plains of China. Hindus, in plain of Ganges.

People of great plains — tendency toward a nomadic life. American Indians, Arabs of the eastern deserts.
Influence upon settlement. Uplands and lowlands of New England compared.
Influence upon industry.
Seashores.
Regular — lack of harbors unfavorable to development of great nations.
Irregular — favorable to growth of nations, e.g., Greece and Rome. Great nations of to-day.
Influence of seashores upon industry.
Relation of climate to man.
Effects of extreme heat, of extreme cold upon man's mental and physical activity, e.g., dwarfs of the African forests, Eskimos of Greenland.
Effects of a temperate climate upon man. Location of the great nations of the world in heat belts.
Dry climate — importance of control directly upon vegetable life, indirectly upon animal life and man.
Industries of semi-arid plains and plateaus.
Industries of well-watered regions of gentle slopes.
Rainfall east and west of the 100th meridian W. longitude noted — effect upon industry.
Industries of regions of extreme cold — of tropical regions.
Relation of economic products to man.
Effect upon migrations. Discovery of gold in California, in Australia. Influence upon industry.
Influence of man upon the earth.
Modification of environment. Land reclaimed from the sea — dykes built, streams diverted, hills levelled, marshes drained, deserts made fertile, etc.
Distribution of plants and animals influenced.
Destruction and limitation of plant and animal life, e.g., buffaloes, seals, forests — effects of destruction of forests.
Distribution of plants and animals extended.
References.
Dodge, *A Reader in Physical Geography.*
Guyot, *The Earth and Man.*
Hayes, "The Southern Appalachians." *The National Geographic Monographs,* pp. 305–336.
Semple, "The Influence of the Appalachian Barrier upon Colonial History," *Journal of School Geography,* January, 1897.
Shaler, *Nature and Man in America.*
Tarr, *Elementary Physical Geography,* pp. 407–419.
Willis, "The Northern Appalachians." *The National Geographic Monographs,* pp. 169–202.

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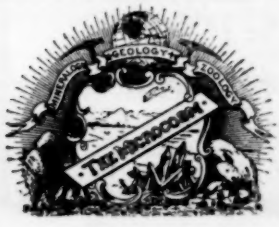

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